

HIGHWAYS
AIRPORTS
HEAVY CONSTRUCTION

ROADS AND STREETS

AUGUST 1951

Only the Timken Company offers all 3 rock bit types



and a complete Rock Bit Engineering Service!

WHAT do you want most from your rock bits—lowest bit cost per foot of hole, greatest possible drilling speed, or other advantages? Whatever it is, you can get it from the Timken Company, the only manufacturer who can offer you all three types of rock bits:

1. MULTI-USE—gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.

2. CARBIDE INSERT—extremely hard and abrasive ground. Drillers spend less time changing bits.

3. ONE-USE "SPIRALOCK"—for use where reconditioning is impractical or undesirable. Lowest unit cost. Has revolutionary new "Spiralock" union.

Because the Timken Company makes all three types, it is possible for our Rock Bit Engineering Service to make unbiased recommendations to meet your drilling needs. Backed by more than 17 years of experience, it is the world's largest rock bit field organization.

FREE BOOKLET! Shows and describes full line of bits. A helpful guide to rock bit purchasing. Write on your company letterhead to The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

*your best bet for the
best bit...for every job*



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

REPEAT ORDERS

represent a lot of confidence in
LA PLANT-CHOATE MOTOR SCRAPERS

THERE'S one big reason why so many successful contractors repeat on buying Motor Scrapers...the job performance that makes earthmoving profitable.

LaPlant-Choate Motor Scrapers have earned their reputation as dependable profit-makers. They've proved their work-capacity under all kinds of operating conditions from one end of the country to the other.

The experience of successful outfits which have made money is worth considering. When you plan for the big construction years ahead, find out why so many profit-wise contractors are 100% sold on Motor Scrapers. Call on your LaPlant-Choate distributor today for a complete description of the many Motor Scraper advantages that will put money in your pocket.

LA PLANT-CHOATE MANUFACTURING CO., INC.,
Cedar Rapids, Iowa.

LAPLANT-CHOATE MANUFACTURING CO., INC.
Cedar Rapids, Iowa



**TYPICAL REPEAT ORDERS
FOR LAPLANT-CHOATE
TS 300 MOTOR SCRAPERS**

LAPLANT CHOATE



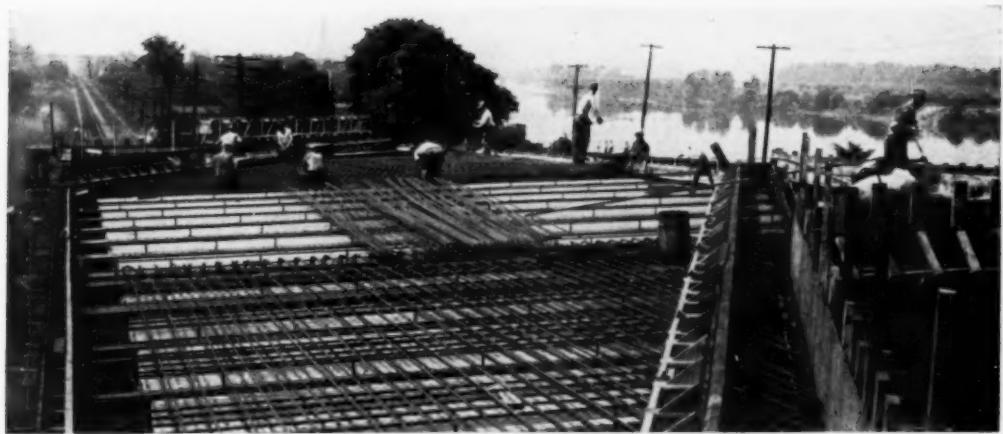
Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.



2- and 4-*yd.* Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.



Network of Bethlehem Reinforcing Bars in deck of highway bridge over Lehigh Valley Railroad near Pittston, Pa.

New Bridge on Pennsylvania's Route 5

One of many relocation projects recently carried out for the Pennsylvania Department of Highways was a short stretch of Pennsylvania's Route 5, between Port Blanchard and Pittston, Pa. The job involved the construction of a two-lane bridge, plus approaches, to carry traffic over tracks of the Lehigh Valley Railroad. The new structure, shown in the accompanying photographs, was built adjacent to a narrow, outmoded bridge. Contractor: Wagner Construction Co., Kingston, Pa. Bethlehem furnished bridge reinforcing, bar mats, and dowel units.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipes
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel



General view of construction, as seen from caboose. Form at right is readied for pour. Narrow, outmoded bridge is visible at far side of form.



Rigged with heavy wire rope, crane lowers bucket of concrete over bridge form.



Workmen place Bethlehem Hinged Bar Mat over first course. Bethlehem Dowel Unit, designed to minimize load-transfer problems, is shown in foreground.

ROADS AND STREETS

August, 1951 • Vol. 94 • No. 8

Roads and Streets represents 59 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892

E. S. GILLETTE, Publisher

CCA

HALBERT P. GILLETTE, Editor-in-Chief

H. J. CONWAY, Assistant Publisher

Coming Articles

Snow and Ice Control

Keeping highway transportation going in winter involves more than snow plowing and chloride application. A forthcoming article will relate how one leading state highway department considers winter problems in all phases of its work: planning, design, construction, maintenance, traffic control.

How 40-ton Rubber-tired Compactors Aided Big Fill Construction

California state highway engineers for first time specified these big rigs, in connection with building a million-yard fill across a reservoir site. Guy F. Atkinson, contractor.

Brewster's Big Rock Trucks

How Geo. M. Brewster & Son, New Jersey contractor, is hauling a million tons of stone from distant quarry for subbase, base and hot-mix aggregates. Sections 3 and 4 of the N.J. Turnpike. Brewster's famed equipment servicing methods will be pictured, along with details of this dispatcher-controlled hauling operation.

Road Design for Heavy Traffic

A relocation for heavy traffic in West Virginia is to be described soon, in an unusual article which tells procedures used in analyzing soils, evaluating traffic, making field subgrade tests, designing the sub-base and base.

Raising a Bridge Above Ohio River Floods

Bridge and roadway are being raised on Ohio River Road into Portsmouth. A staff article will picture the contractor's methods.

Also Coming

Marland engineers develop better bituminous extraction test . . . Edens Highway entering Chicago to be described; first link opens to traffic in September . . . Ohio contractor used novel traffic control methods to handle 12,000 vehicles daily past concrete pavers . . . Job and Equipment Ideas . . . Something for contractors, engineers, officials in every issue of Roads and Streets. Articles and job photos invited from readers.

HAROLD J. MCKEEVER, Editorial Director
C. T. Murray, Managing Editor
Col. V. J. Brown, Associate Editor
W. W. VanStone, Production Editor

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A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

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Speed-Power-Guts-

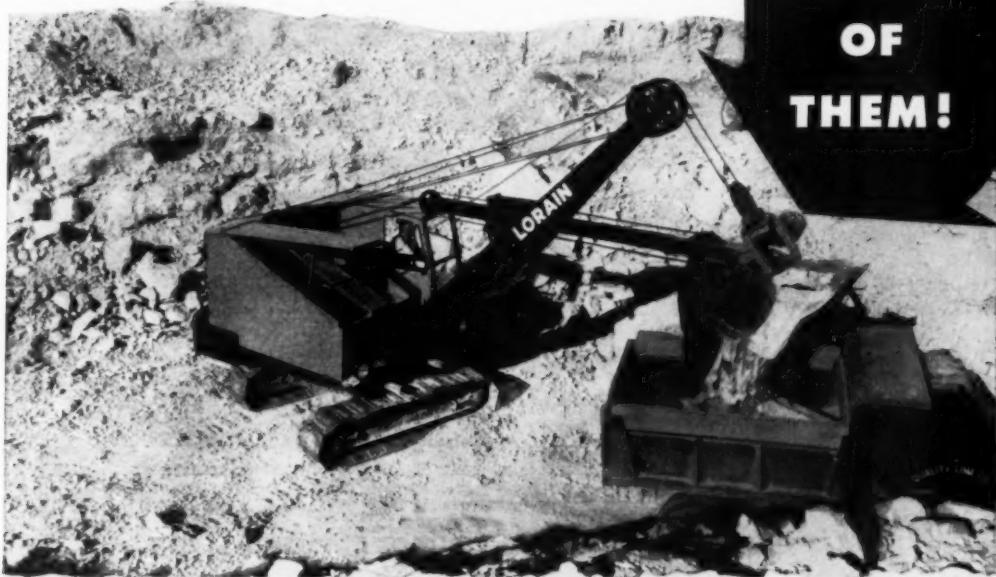


Lorain TL-25 machines have all of these important profit-making qualities . . . SPEED — responsive clutches and rapid acceleration save seconds per trip, and more trips per day mean more yardage . . . POWER — abundant power from a "plus" engine is delivered by a high-efficiency transmission to just where you want it, when you want it . . . GUTS — if you mean ability to take punishment and to hang-on relentlessly until the job is done, "TL-25's" have it . . . or if you mean the "insides" of the machine, "TL-25's" again have it in advanced design and construction that give you these features . . .

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Your nearest Thew-Lorain Distributor can show you these TL-25 features at work!

THE THEW SHOVEL CO., LORAIN, OHIO



THE LORAIN.

SHOVELS • CRANES
HOES • DRAGLINES
CLAMSHELLS
ON CRAWLERS OR RUBBER-TIRES

Like the Hunter and His Dog . . .

they Go Together



ALL-WHEEL DRIVE



and ALL-WHEEL STEER

What makes it easy for the front truck to ride the bank? . . . ALL-WHEEL DRIVE!

What keeps the rear truck running smoothly down on the road? . . . ALL-WHEEL STEER!

On jobs like this, and hundreds of others, this pair of exclusive Austin-Western features works as a team to do better work, and more of it. A profusely illustrated catalog which tells the whole story is yours for the asking.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

Subsidiary of Baldwin-Lima-Hamilton Corporation



B.F. Goodrich



Pick your toughest hauling job— hand it to these tires

ROSCOE KREAGER, Supt., right above, watches a loading operation at the quarry of the Woodville Lime Products Company at Woodville, Ohio. Here, Mr. Kreager sees a giant crane dump a bucket of limestone into a trailer equipped with B. F. Goodrich Universals. This is a year-round operation at Woodville as the company processes limestone, fertilizers and other kindred products for nation-wide sales.

Some thirty vehicles are used by this company for intraplant stone hauling. According to Kreager, BFG Universals are used on all of these vehicles, and the company is well pleased with the

performance of the B. F. Goodrich tires on these vehicles. Subjected to exceptionally hard wear, they travel over stone and razor-sharp rocks with equal traction in forward or reverse gears because they are nondirectional!

B. F. Goodrich Universal tires were selected on the basis of service and quality. These tires have greater bruise resistance and greater ability to absorb and withstand shocks because they're built with the patented *nylon shock shield*. Strong, protective layers of nylon are built in between the tread rubber and the cord body of all BFG tires of 8 or more plies . . . and at no

additional cost to you.

There's a special B. F. Goodrich tire for every off-the-road service. See your local dealer. Let him help you get the benefits of longer tire life and lower operating overhead. *The B. F. Goodrich Company, Akron, Ohio.*



"PERFORM WELL in



On short 350' haul, 2 D Tournapulls move 50 LOADS PER HOUR

Arthur Cushing — Frank Converse,
owners of The Great Lakes Construction Company in
Cleveland, Ohio, had a 25,000-yard contract to widen
and straighten 2 miles of Cleveland's heavily-traveled
Lake Shore Highway (State 283). Open traffic had to be
maintained at all times, even though most of the scattered
cuts and fills required hauls across the existing pave-
ment or next to it.

Contractors Cushing and Converse needed a fast, mobile,
medium-sized dirtmover for lowest cost operation on this
task. Their LeTourneau Distributor had the answer . . . two
28 m.p.h., rubber-tired D Roadster Tournapulls.

"The D Roadsters set us ahead of schedule right from the
start," says Cushing. "We like their performance in tight
places and they fit right on the job." Rubber tires did not
damage pavement and output was uniformly high. Check
the record for yourself . . .

On typical, short 700' round trip . . . loading, traveling
parallel to existing highway over rough haul road, spread-

ing, and returning up 12% grade out of fill . . . each
Tournapull completed the cycle in slightly more than
2 minutes, delivered 23 loads an hour. Material was
mostly sandy topsoil. Average hourly production for each
Roadster, as measured on a 2-hour time study and checked
against contractors' own figures, was 137.5 pay yards
. . . combined output for the 2 high-speed, rubber-tired
rigs was 275 pay yards hourly.

Widen road 14 to 16 feet

When the picture above was taken, the "D's" were "day-
lighting" a sharp curve just east of Cleveland. Later,
they widened both sides of the route 7 to 8 ft. . . . built
shoulders all along the 2-mile construction section . . .
and finished the sub-grade for surfacing.

Consider what this high-speed versatility and mobility
can mean on your dirtmoving. Get all the facts . . .
write or ask your LeTourneau Distributor about 28 m.p.h.
D Roadster Tournapulls TODAY.

To: R. G. LeTOURNEAU, Inc., Peoria, Illinois

Please send Specifications Price Job performance reports on 7-yd., 28 m.p.h. D Tournapull



NAME _____
COMPANY _____
STREET _____
Type of work to be handled _____

CITY, STATE _____

Mail
Today

TIGHT PLACES..."



With 7-yard (9-ton) capacity Scraper, this 122 h.p. D Roadster has proved itself a profitable tool in push-loaded fleet operation for Great Lakes Construction Co. "D" also saves money on one-man, self-loading assignments and is especially valuable working either alone or in fleets on cramped-quarter dirtmoving jobs.



Wm. Cinader replaces shovel and 3 trucks with one D Tournapull

Contractor William Cinader used his D Roadster for 25,000 yards grading streets and leveling for 500-home subdivision at Royal Oak, Michigan. He says, "Roadster eliminated 3 to 4 trucks and 5½-yd. shovel plus one grade foreman. Operator carries own grade, keeps ahead of gravel trucks. We cut costs . . . got more production . . . more profit . . . had less worry." Self-loading to grade, dumping in highly restricted quarters among houses and basements, on hauls from 300 to 500', the "D" averaged 20 trips per hour, Cinader reports "not one minute of downtime for the Tournapull."



Noel Brothers cut costs 20% on warehouse grading in Tennessee

Grading for a new tobacco warehouse at Greeneville, Tenn. required loading and dumping in narrow lanes between foundation walls and supporting columns. Noel Brothers kept very accurate cost and time studies of all their equipment on this job. These records show their push-loaded D Roadster outhauled their 144 h.p. tractor and LP Carryall by 25 yards per hour . . . moved dirt 20% cheaper. From here, the "D" was used on a heavy work schedule of other small-yardage grading jobs. The rubber-tired Roadster drove at high speeds over main highways from job to job, saved about 30% of the costs of moving crawler-scraper equipment.

Tournapull, Carryall—Trademark Reg. U.S. Pat. Off. 2714

LE TOURNEAU



TOURNAPULLS

FOR LOWEST NET COST PER YARD

nothing slow about this crawler



"BIG RED" DIGS IN. The International TD-24 does through tough going faster, pushes bigger bladefuls farther, moves more pay-dirt per day. It's the "Champ" for sure!



Read what makes International's TD-24—the Big Red "Champ"— finish ahead of the field!

Man or machine, it takes speed and strength and stamina to take on all comers and leave 'em trailing behind. It takes guts and power to spare to be the "Champ."

In a human, it means running a faster race, hitting a harder ball, fighting a tougher fight. In the TD-24, it means doing more work in less time than any other crawler on the market.

More speed—8 forward and 8 reverse speeds up to 7.8 mph for faster time cycles on the job.

More power—148 maximum drawbar horsepower—to take

a bigger load on the scraper, a bigger bite on the blade and move dirt faster, easier, cheaper.

More flexibility—synchromesh shifting "on the go"—instant change up or down one speed without declutching—Planet Power steering for pivot turns, feathered turns, turns with power on both tracks.

The TD-24 gets in and out and back in again faster—moves more dirt each time—makes more money for its owner every working day.

It's the Big Red "Champ" any way you look at it.

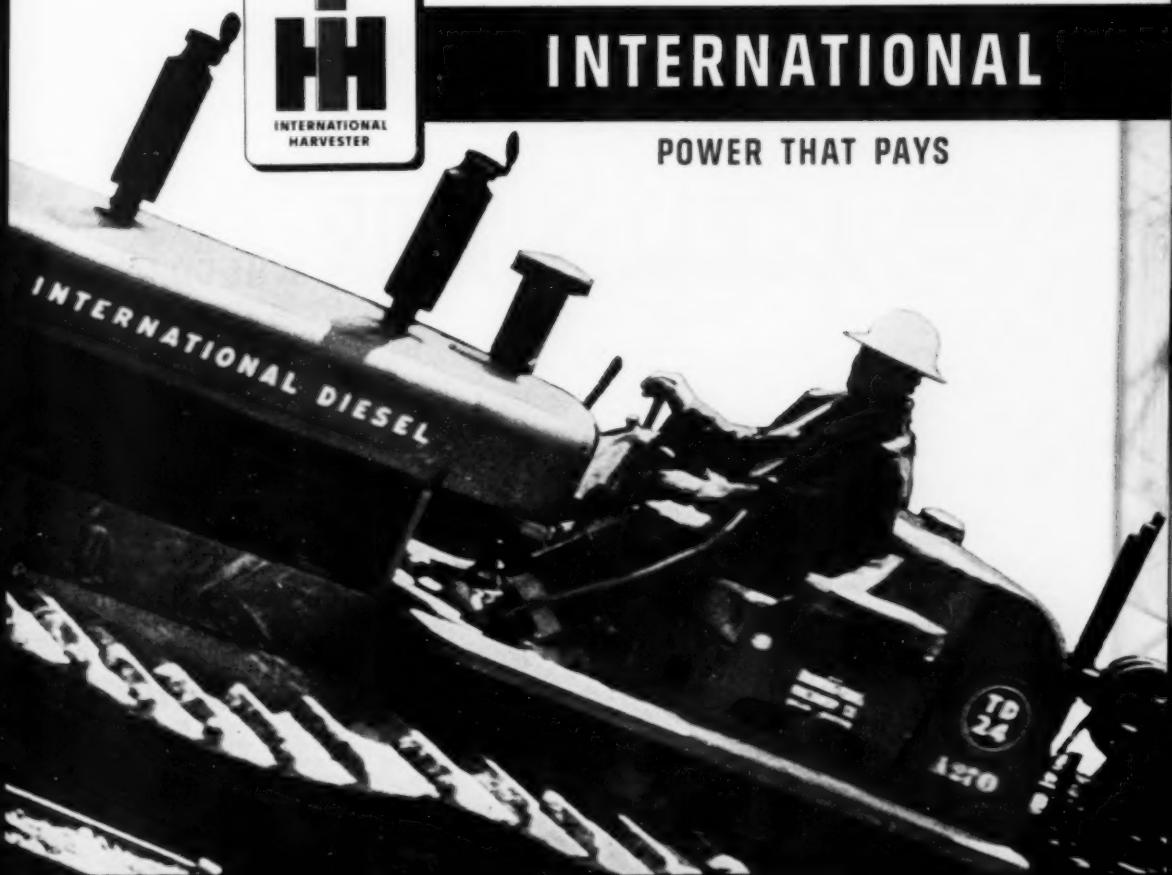
Come in and look. Ask your International Industrial Distributor for the low-down. Find out about his fast-moving parts and service setup, which will keep your International power on the job for years to come. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL

POWER THAT PAYS





Cleaning shoulders and ditches through hard-packed top-soil calls for TRAXCAVATOR power! One of many year-round, money saving jobs completed in Douglas County by the HT4.

YOU NAME IT A TRAXCAVATOR WILL DO IT!

Whatever your job, digging, loading, grading, 'dozing, excavating, stripping, backfilling, land-clearing, ditching, snow-removal—whatever the material—a TRAXCAVATOR will do it... faster and cheaper.

Douglas County, Colorado, uses their versatile HT4 TRAXCAVATOR to clean shoulders and ditches, feed sand and gravel to a screening plant as well as many other jobs throughout the county.

Converting dependable "Cat" Diesel Tractor power to work-power, these economical and rugged tractor-shovel teammates are designed to meet any task. Powerful digging action gets heaped loads every pass... balanced design... wide tracks allow high gear hauls... positive dumping gets all the material out of the bucket... high lift gets the load into any hauling unit. And the rear of the tractor is free for drawbar work or installation of other equipment.

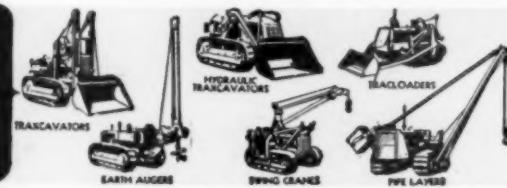
There are five TRAXCAVATOR models with capacities from $\frac{1}{2}$ to 4 cubic yards... with a full line of attachments to increase job range! See your TRACKSON—"Caterpillar" Dealer or write TRACKSON COMPANY, Dept. RS-81, Milwaukee 1, Wisconsin.



Digging and feeding pit-run gravel to the screen hopper, this hydraulically controlled HT4 TRAXCAVATOR handles over 500 cubic yards a day for Douglas County, Colorado.

TRACKSON

TRACTOR EQUIPMENT



Mechanical soldiers need good shoes, too!

THESE are days of grave concerns . . . of conservation and mobilization for strengthening the nation's defense—for the survival of our national economy—for the continuance of useful highway, airfield, dam-site, reclamation and other construction programs—for the keeping of every home-front machine in condition to stay on the job until its replacement again becomes a normal procedure.

That includes *your* equipment and emphasizes *your* responsibilities. To benefit fully from the productive life that has been built into your "Caterpillar" equipment, you must be alert to its needs as time and hard usage take their toll in wear and depreciation. For instance:

How are your "Caterpillar" track shoes?

Tough as they are, they can't battle rocks, shale, jolts and grinds forever. Growing shortages in the premium steels that go into them may make early replacements difficult—and extra care of track parts something to think about.

CATERPILLAR, PEORIA, ILLINOIS

**DO
THIS
NOW**



YOU'RE THE DOCTOR. Check those sprockets, grousers, rollers, idlers, pins, links and bushings. Proper track adjustment minimizes wear. Sprockets may need switching from side to side, and pins and bushings need turning, to provide new wearing surfaces. Shoes serve longer if you have worn grousers built up before excessive wear occurs.

Reread your Operator's Instruction Book. Anticipate your future parts requirements. Take the facts to your "Caterpillar" dealer. His modern facilities and skilled servicemen are at your disposal. He can rebuild many parts to keep your machines on the job. Their added life will repay the reconditioning cost over and over.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

Before you buy any

Trencher

Check

PARSONS*



* Your Parsons Distributor

is interested in helping you increase your trenching efficiency, production and profits. He has latest facts on all Trenchliners in the Parsons heavy-duty line . . . information that will provide the lowest cost answer for your work. Before you buy any trencher, be sure to check the big-capacity 310, industry's largest full crawler-mounted, ladder-type Trenchliner . . . general-purpose Model 250 . . . or smaller 221 Trenchliner. Call on your Parsons distributor NOW.

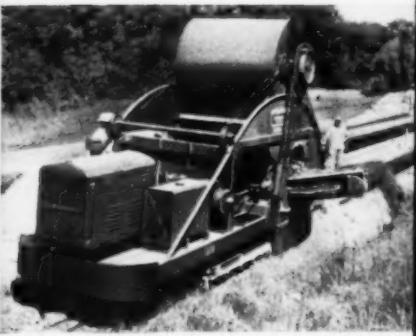


PARSONS Trenchliners

PARSONS COMPANY, NEWTON, IOWA (Established 1881)



PARSONS BIG-CAPACITY 310
Trenchliner digs 1½ to 4½" wide
at 17' depth . . . and up to 6'
wide at 11' depth . . . has 45 dig-
ging feeds, 8" to 15'·6" per min.



250 TRENCHLINER produces
clean-cut, smooth-walled trench-
es 16 to 42" wide, and up to
12'·6" deep . . . 30 digging feeds
from 3·8" to 9'·9" per minute.



PARSONS 221 Trenchliner digs
16" to 36" wide, to 8'·6" deep.
30 digging feeds, 6·5" to 13'·
10" per min., assure top output
at any depth, width, in all soils.

Equipment for the construction of roads and streets

Kwik-Mix Tower Loader attachment discharges bituminous mix into trucks, overhead hoppers, or stockpiles . . . provides 7'·9" discharge height for Kwik-Mix 10 cu. ft. Bituminous Mixer . . . 8'·9" height for 14 cu. ft. mixer. Bucket holds full batch, is powered by mixer engine, dumps automatically at top of tower. Also available for 16-S, 11-S Dandie® Concrete Mixers. Get more information from your Kwik-Mix distributor today.

KWIK-MIX (Koehring
Subsidiary)
Port Washington, Wis.



Equipment for the construction of roads and streets

Available in 4 sizes, Johnson Single Silos provide 254, 373, 492 and 611-bbl. cement storage capacities . . . have gasoline or electric-driven screw conveyor and bucket elevator, box-car, truck receiving hoppers or undertrack unloading arrangement, electric bin signals, aeration diffusers, one or two 1000-lb. batchers. Larger batcher, additional leg and elevator height available for truck charging. Also, ground level silo stores 1032 bbls.

C. S. JOHNSON (Koehring
Subsidiary)
Champaign, Ill.



Equipment for the construction of roads and streets

As a heavy-duty hoe, Koehring 1½-yd. 605 digs 24 ft. below crawlers, has fast swing, quick dump . . . readily converts to shovel, dragline, clamshell, or to 36-ton lift crane. Before you buy any excavator or crane, it will pay you to check all Koehring heavy-duty sizes . . . up to 79½ tons lift capacities . . . dipper capacities up to 2½ yards. Your local Koehring distributor has specific facts and figures. Call him today.

KOEHRING COMPANY
Milwaukee 16, Wis.



3 New Ways to Cut Costs with Le Roi TRACTAIR

(Tractor-Compressor)

Tractair with its combination tractor-105 compressor feature and its many attachments has provided money-saving usefulness for contrac-

tors, utilities, and municipalities everywhere. Here are 3 new attachments that have already proved their ability to reduce costs:



2 Tractair Patch-Drill saves on pavement patching and trench opening

This unit consists of an air-feed Le Roi-CLEVELAND H-10 sinker (45 lb.). It permits easy, fast drilling of a succession of holes. Then, using the same machine, all you have to do is broach out the web between the holes and lift out the entire section of pavement. There is no loading problem — no shoveling. Holes can be drilled and broached in an 8' radius. Tractair supplies air power, mobility, and, when equipped with front-end loader attachment, lifting power, too.



----- Tear out this coupon and mail TODAY! -----

LE ROI COMPANY
Dept. RS-E, 1768 So. 68th Street, Milwaukee 14, Wisconsin

I want to know more about Tractair's ability to cut costs. Please send me your new 70-page Tractair Application Book.

Name _____ Title _____

Company _____

Address _____

City _____ (_____) State _____

7-58

1 Tractair Backhoe saves on small digging jobs

It gives you air power for breaking through pavement, frost, or running other air tools. Then the hydraulic backhoe takes over — does your digging fast and easy to a depth of 8 feet. Plenty of power for roots, broken concrete or hard ground. Digs straight end walls and loads to a height of 6'2".



3 Tractair Multiple Tamper saves on tamping operations

Thanks to Tractair mobility, the tamping effectiveness of the Le Roi-CLEVELAND 3-Tamper arrangement and work-saving air feed, this unit can keep up with three men shoveling or a back-filling tractor. Not only is tamping faster and easier, but you also get better compaction and lower costs.

Learn more about the money-saving usefulness of Tractair for your own type of work. Send today for the 70-page, information-packed Tractair application book.



LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland • Greenwich, Ohio

RIGHT UP
ON THE
SIDEWALK
smack against the
STORE FRONTS

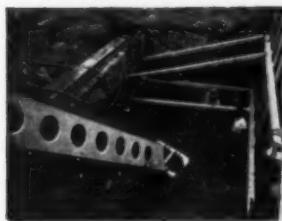


Photo above shows the rocks and concrete that had to be excavated.



The job occurred in the heart of downtown Syracuse at one of the busiest intersections. Gradall's ability to work in close quarters avoided traffic troubles.

THE JOB—a deep, narrow excavation for a big electrical transformer. To contractors, the accompanying photos tell the story better than words. "Thanks to that telescoping boom," said the construction engineer on this job, "it's the only machine that could do it."

The Gradall, with its versatility, mobility, and amazing precision is proving to be a labor-saver and time-saver, and a money maker on all kinds of jobs. Owners keep them mighty busy. Your Gradall distributors can furnish full information on mechanical details, on standard and specially built tools, prices, etc.

Gradall Distributors
in over 60 principal cities
in the United States and Canada

Digging vertical walls in crowded
quarters, around sewers and other
utility lines called for utmost precision.



GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE

GM DIESEL powers world's most compact 600 cfm Compressor



CONSTRUCTION—"Starts like a charm, even on the coldest morning. No time wasted in getting up to pressure. Runs a heavy pile driver with ease. We can set it out of the way with a crane and move it back to the roadway for towing in no time."



QUARRYING AND MINING—"We couldn't imagine 600 feet coming from such a slick little compressor until we saw the increased drill footage, and the ease with which it took over two FM-2 wagon drills. Good fuel economy, too."



HIGHWAY BUILDING—"Plenty of reserve—full capacity at 6,730 feet altitude. We're operating eight 55-lb. blower drills putting in 20-ft. holes on cliffsides. So easy to maneuver and work with that it's a natural for tough jobs like this."



WINNING acclaim as the world's smallest, lightest, big-capacity portable compressor, the new Ingersoll-Rand Gyro-Flow 600 is powered by a 6-cylinder General Motors Series 71 Diesel engine.

This compact, high-powered portable delivers a full 600 cubic feet of air per minute at a steady 100-lb. pressure, yet it weighs only 9,500 pounds. It is 20 to 40% lighter—and as much as 20% smaller—than other portables of comparable capacity.

Being 2-cycle, GM Diesel engines pack more power in less space. They start quickly on their own fuel, run smoothly and enable equipment to maintain rated performance at high altitudes. They're designed for ease of maintenance—no high-pressure fuel tubing—unit injectors that can be changed in a matter of minutes. And, when needed, low-cost "Factory-Engineered" parts are readily obtainable.

These modern 2-cycle Diesels are bringing new economy and efficiency to more than 500 different kinds of power equipment built by 120 manufacturers. Ask your GM Diesel distributor or write us for full details.



DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...Up to 275 H.P. DETROIT 28, MICHIGAN MULTIPLE UNITS...Up to 800 H.P.

GENERAL MOTORS

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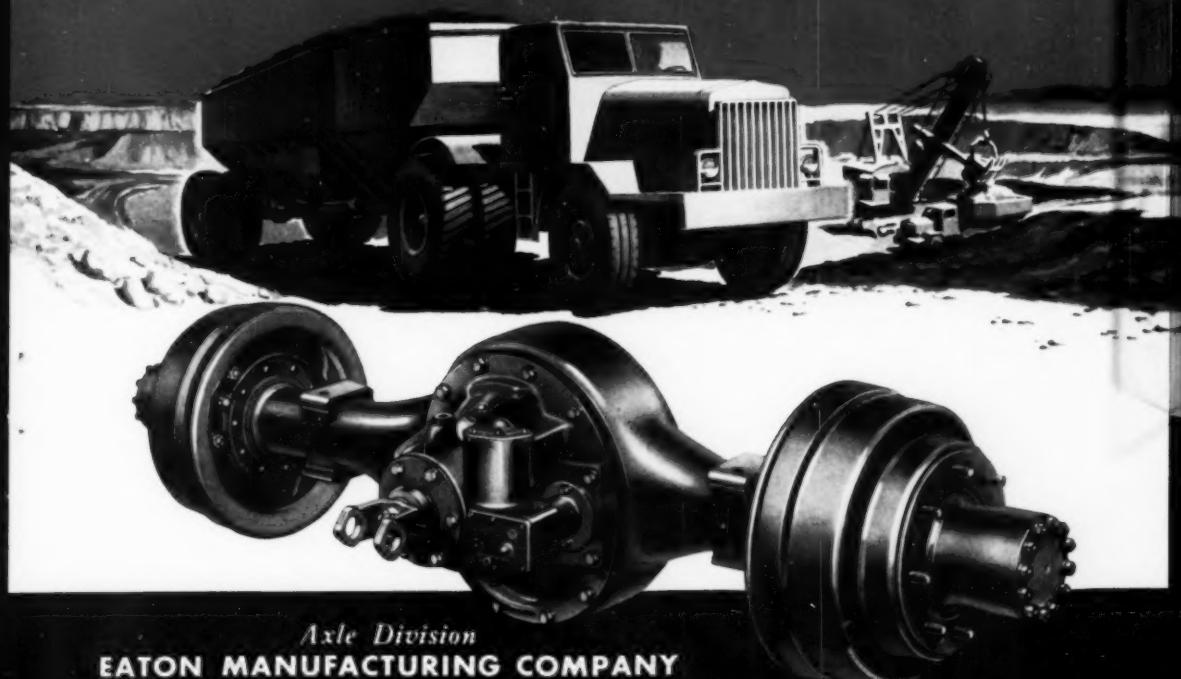
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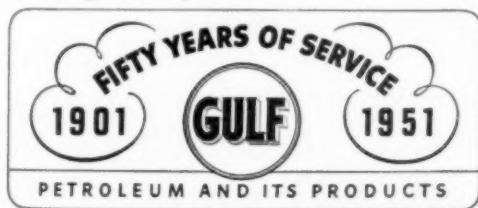


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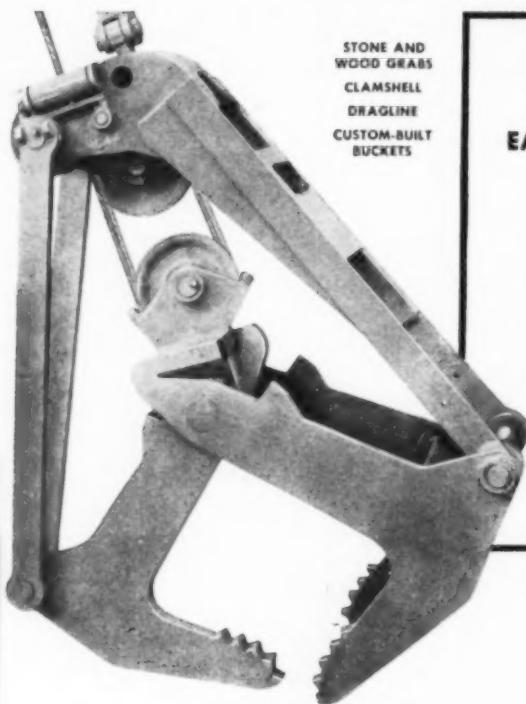


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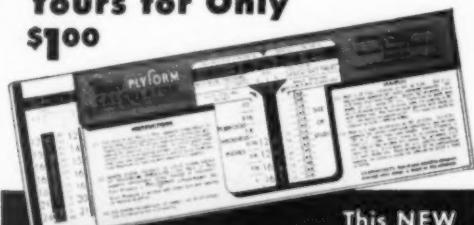
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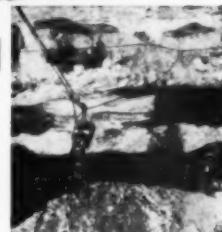
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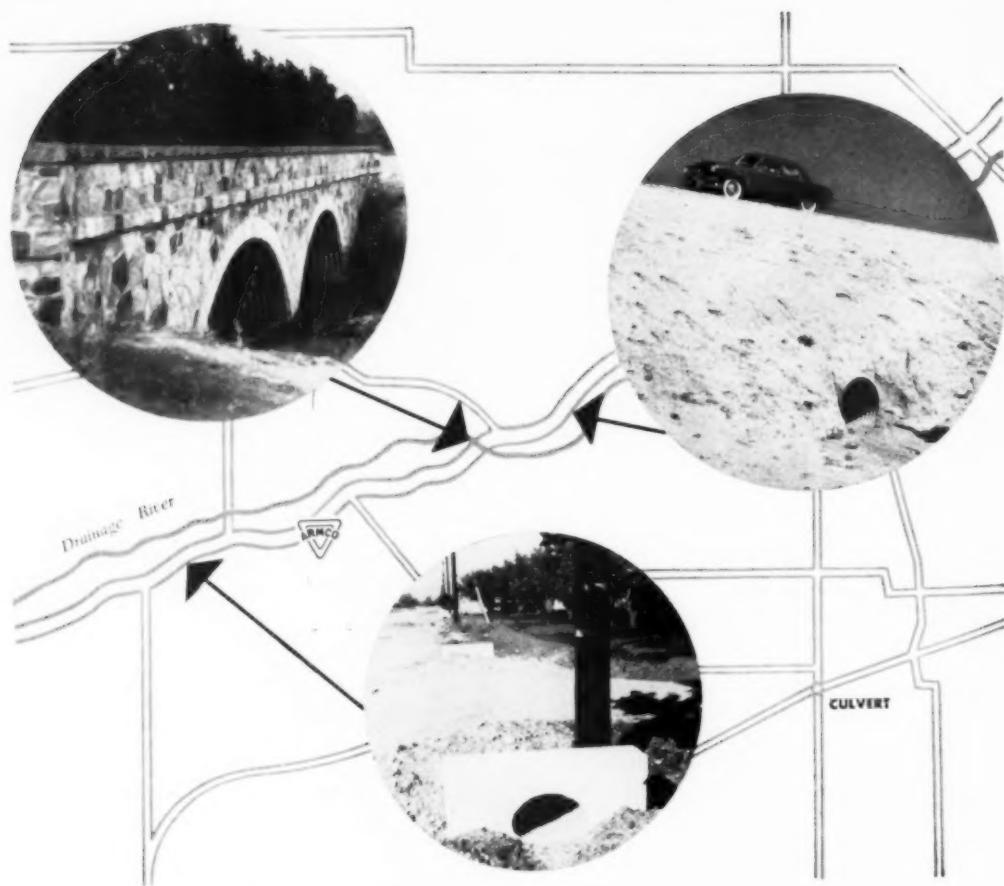
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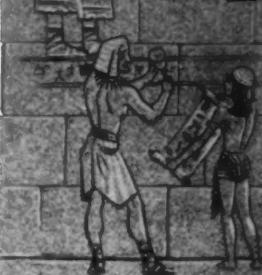
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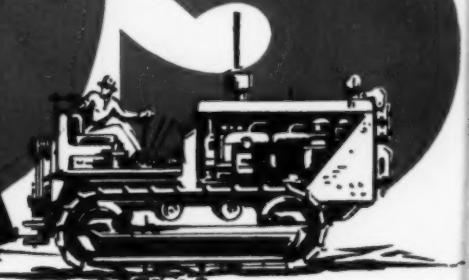
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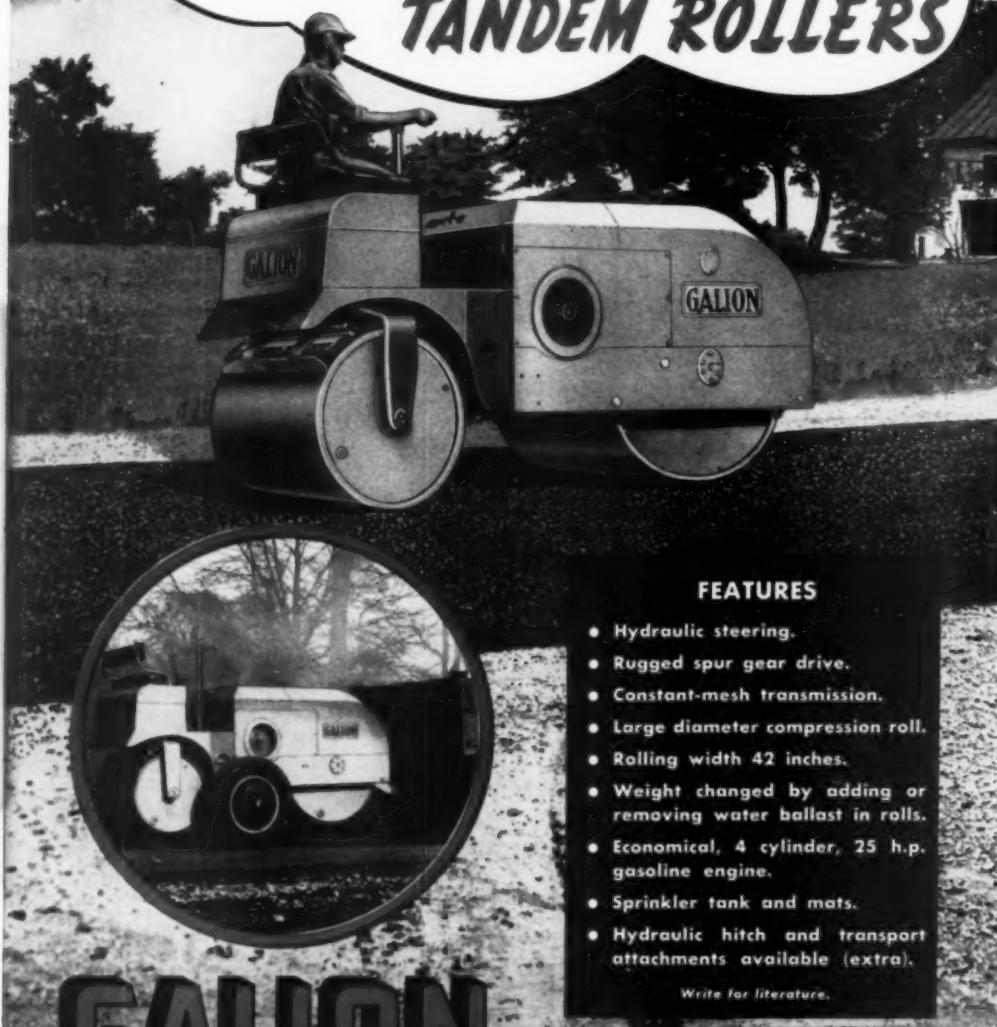
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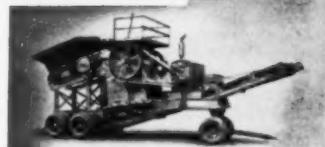
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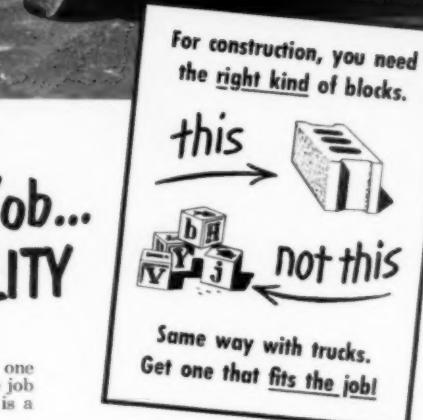
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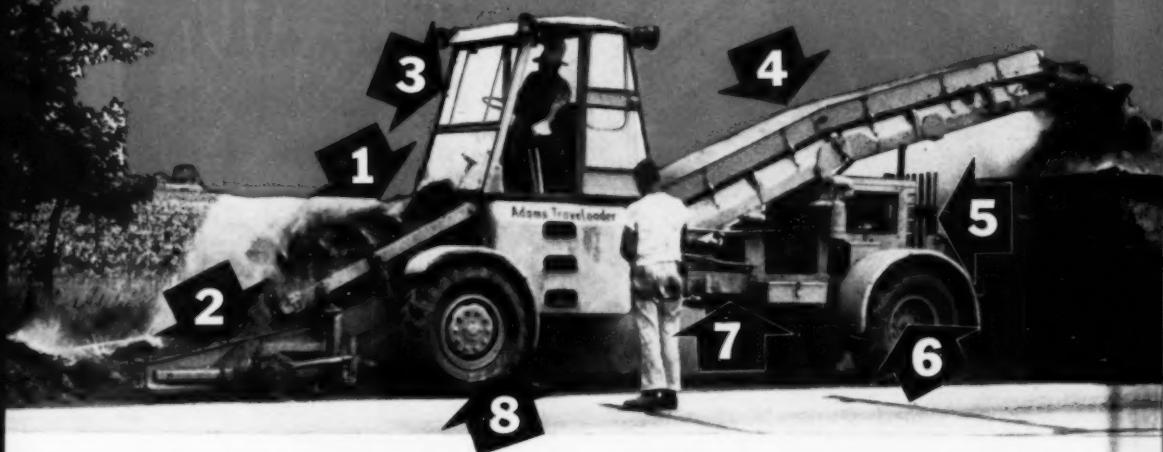
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Editorials

★ Highway Study Committees Considered in 13 States

About the best news in the highway field in a long while is the report that highway planning committees and other related study committees have received legislative attention in a number of states. A thorough factual study of the entire highway transportation picture within the state is the first step towards resolving differences and bringing before the people of a state a concrete proposal which their elected representatives can use as a guide.

We don't know how many proposals for such committees have made ground since their announcement some weeks ago, but several such committee activities are definitely in the wind, according to a report from the National Highway Users Conference.

North Dakota: A new law directs the Legislative Research Committee to study and analyze all facts pertaining to development of a program of construction, improvement, effi-

cient administration, and sound financing of highways, streets and bridges. A committee is directed to arrive at an informed estimate of the total costs of such a program, and to determine how such costs can be allocated to the state and various government units in accordance with the benefits to each.

Washington: A new law continues for another two years the "Joint Fact-Finding Committee on Highways, Streets and Bridges" consisting of six Senators and six Representatives. This committee is authorized to participate in the "Western Interstate Committee on Highway Policy Problems," under which 11 states are cooperating in a review of their state highway systems and a study of motor vehicle weights, highway design and cost, and other related matters.

Colorado: Official highway study committees are being continued for another year.

Utah: This state is also continuing with a committee which has already been set up to study the road problem.

Measures were introduced recently into the legislatures of Wisconsin, New Mexico, New York, Maine, New Hampshire and Iowa.

When a state legislative body tries to decide on a single phase of highway taxation or fund distribution, it immediately finds that hundreds of other phases are clamoring for attention because of their close interrelation. Likewise, when such a body listens to the wishes of pressure groups, many of which are sincere and deserving, it has no yardstick for judging the merits of the petitions. Major legislative decisions made in the absence of an over-all fact-finding study certainly leaves John Q. Public out in the cold and have little hope of bringing about maximum development of the highway system.

★ More About Highways vs. Trucking

The May issue of Roads and Streets carried an editorial headed "The Jersey Turnpike Job Poses Some Questions." Comments on it are still coming in. Many letters came from our friends in the trucking industry.

We looked back to see what we had said that had aroused such a commotion. After mentioning the fact that the New Jersey Turnpike provided for a 36,000 lb. maximum axle load, we went on to say "Heavy Trucking is accelerating the destruction of thousands of miles of arterial roads (and don't let any trucking group tell you different!)."

To clarify this point a bit, it hardly needs saying that it is the load carrying capacity built into the construction of highways that determines the degree of resistance to wear and tear. This is a point frequently stressed in these columns. We are glad that some segments of the trucking industry are doing their part to educate the public on the importance of adequate road

construction, and are pointing out that what lies under the road surface is as important as what rides over it in determining how long the pavement will last.

The best public statement we have seen recently on the subject was made by E. D. Bransome, president of Mack Trucks, Inc., printed in "U.S. News and World Report." Asked by the interviewer whether trucks are now ruining the roads, he said: "Certainly they are tearing up roads that are obsolete, roads that weren't built for heavy traffic and that were built for different conditions than exist today. Just the same as modern trains would tear up rails that were built for lighter equipment."

Mr. Bransome went on to suggest a practical objective for us in the present situation: "We must build our way out of our problem just as we have done with every other problem since the United States was born. We didn't just quit. Yes, we must build

our way out of it and that means build roads to accommodate the traffic of today—automobiles, trucks and busses."

Highway engineers and administrators will agree that Mr. Bransome has indeed stated the \$64 question. Not all roads can be built for the heaviest loads, else we'll go broke. How to plan, finance, design, construct, traffic-manage, and maintain highway systems to be of maximum efficiency in an age of heavy trucking is the over-all objective. The immediate problem of designing heavy roadbeds meantime must be pursued through more intensive engineering research, with a minimum of preconceived notions, and with a fuller spirit of give and take by all parties concerned. The physical problems in designing for heavy traffic are complex; the problems of equitable taxation and wise traffic regulation, even more so. It is a time for common sense thinking and mutual understanding.



★ Movable tripod type "Observe Flagman" sign used on this Minnesota project, where flagmen are particularly important due to passage of earthmoving equipment across the road. Photos, June, 1951

Minnesota Engineers and Contractors Cooperate for Safer Traffic Flagging Through the Job

The Minnesota department of highways has adopted standards of signalling and flagman conduct, which have been incorporated in construction contracts. The Associated General Contractors of Minnesota has cooperated in working out this safety program and making it effective.

By C. L. Methven

Construction Engineer, Minnesota Department of Highways, St. Paul

SINCE 1938 certain standardization of signals for regulating traffic past construction work have been incorporated in Minnesota Department of Highways construction contracts. This effort has paid off well for the contractors, in the forms of reduction in accidents and attendant work stoppages and expense, on arterial road jobs where traffic is routed through the work. It has also provided a safer and more orderly control of traffic from the motorist's viewpoint.

Most recent developments in this program include the practice of including a payment item for flagmen hours, and the use of white Sam Browne belts by all flagmen, as will be discussed.

Accompanying this review is a summary of flagmen regulations, as adopted in 1947 and in force today.

It will be noticed that we require all signals to be made by the free hand not holding the flag. The flag is held stationary and only lowered when traffic is ordered to proceed. This requirement resulted from a near fatal accident years ago when a flagman attempted to stop a motorist while waiting for a powder charge to be detonated. Noticing that the driver was not slowing up as much as he should in order to stop, the flagman violently waved his flag back and forth only to have the vehicle speed by right into the explosion area. Fortunately the driver was not killed. He explained later that he thought, from the manner in which the flag was being waved, he was being urged to hurry past the power shovel as quickly as possible. Since then we have not permitted the flag to be waved as a signal for traffic to proceed. Violations of this requirement occur only with untrained men. It required considerable training and missionary work with foremen as well as the contractor's workmen to counteract the natural tendency for flag waving.

Instructions to ...FLAGMEN



Signals Should Be Definite

Hold flag in right hand to stop traffic. Give signal to proceed with left hand or orally. Do not wave flag. Do not use flag as signal to proceed.

★ Front page of a printed instruction leaflet, given out to all flagmen and carried by them while on duty



★ (Left): Note how flagman gives the come-on signal with his free arm—not with the flag. (Right): flagman holds flag stationary while stopping traffic. Uniform stylechauffeur's caps as well as dark colored shirt or coat is also being required this year on Minnesota jobs

Traffic Usually Handled

Much of our work of reconstruction and widening or grade lifting of our heavy traffic routes is of a nature where the traffic can be satisfactorily

handled through the several construction operations provided better control of the moving vehicles can be obtained. Much of our annual program of work is this type of reconstruction.

*Specification clause 1708, Minnesota Department of Highways,
July 1, 1947*

Minnesota Flagmen Regulations

Only reliable men, who are physically active and mentally alert, shall be used as flagmen.

It shall be the Contractor's responsibility to properly instruct each flagman as to his duties.

At night, each flagman shall be equipped with a white cap or a wide white hatband to be worn while on duty.

For daylight flagging, the flagman shall be equipped with a red flag, not less than 2 feet square, fastened to a staff about 5 feet in length.

He shall be stationed just outside of the traffic lane. He shall be near enough to the point being protected so that there is no doubt as to the purpose of his work, and at the same time far enough away so that a driver can get his vehicle under control without causing any damage. Due regard must be given to the customary speed of approaching traffic and to the particular location with respect to the gradients, curves or hills, and to the condition of the road surface.

The flagman shall face the oncoming traffic with his arms outwardly extended and the flag held in the right hand. The flag shall not be waved but shall be held stationary until the approaching vehicle has come to a stop.

In signaling vehicles to move ahead, the flagman shall lower the flag and give the signal with his free hand. The flag shall never be used in signaling vehicles to proceed.

When the flagman wishes to slow down an approaching vehicle without stopping it, he shall extend the flag in the manner hereinbefore prescribed until the vehicle has reduced its speed to the required rate; he shall then lower the flag and signal the vehicle to proceed before it comes to a full stop.

For night flagging, in addition to the open-flame torches required by 1707.2, the flagman shall be equipped with a bright, substantial light. He shall wave the light rapidly back and forth across the path of the approaching vehicle until it has stopped. The vehicle will be permitted to proceed only after the driver has received oral instructions or signals from the flagman.

We have, in this state, a cooperative committee composed of official representatives of the Associated General Contractors of Minnesota, Inc. (R. J. Hendershott, manager), and of the several department heads of the Highway Department and their assistants. This joint committee group meets about once a month. Numerous problems and policies relating to specifications and the control of work are discussed as they arise or are of current concern to both the contractors and the department.

Over a year ago a project devoted to public safety and traffic control was made the responsibility of a special committee. From this work a much better appreciation of the importance of good public relations developed for both contractors and our field engineers. Studies were made of more effective barricades, signs, traffic control devices, flagmen, etc.

Whole-hearted cooperation of the contractor's superintendents and of the field engineers of the department, directed to better and more courteous traffic control, has brought forth favorable reaction from the public generally and much more patience and understanding from the motorist and the truck driver individually. Much credit can be given to the Associated General Contractors-Highway Department Cooperative Committee in making traffic service a very important part of our construction responsibility.

Contractors' Bulletin

Some of the steps adopted were recently described in a bulletin by A.G.C. to its members in part as follows:

"(1) Project engineers are being directed to confer with contractors at the beginning of work to analyze measures for the protection and guidance of the traveling public, with spe-



★ Standard "Under Construction" signs at each end of the job on Minnesota projects also say "Observe Signs and Flagmen"

cial emphasis to be placed on the responsibility of the project engineer and the cooperation of the contractor to see that traffic warning signs and traffic control signs keep up with the progress of the work so that they may mean something to the public.

"(2) The standard specification section No. 8008-A now provides for the

Comments on Sam Browne Belts

Introduction of Sam Browne belts and other elements of uniforms among highway construction flagmen requires considerable education work, according to C. L. Methven, construction engineer, Minnesota state department of highways. In this state the regulations described herein have not always been readily lived up to, for several reasons. First the old belts made of webbing became soiled and seemingly the men became ashamed to wear them; at least the belts didn't lend the desired dignity or official significance to men in work clothes. Also, younger flagmen such as students on summer work like to peel off their shirts and in so doing found that the belts chafed their sunburned skin.

Smooth plastic belts, more comfortable and more easily cleaned, or kept clean, are to be used hereafter on Minnesota jobs. The highway department feels that since flagging is a pay item, it has the right to insist on flagmen wearing shirts and distinctive belts, as a measure to increase the effectiveness of flagman service.

Continual attention to detailed matters affecting traffic safety along road jobs is an important part of the highway department's and the contractor's job.

placement of job signs carrying a contractor's name and address at each end of a project. The purpose behind this requirement is primarily to develop in the workmen on the project a more complete sense of responsibility for courteous treatment of the traveling public. Space is provided in the requirements for the sign for the placement of an AGC emblem. These emblems are 10 in. in diameter, made of metal and in color. They may be obtained by AGC members from this association.

"(3) The Special Provisions now contain the following requirement:

All flagmen, while on duty, shall wear a white "Sam Browne" type belt not less than 2 in. wide around the waist, the strap over the shoulder being not less than 1 in. in width.

The thought behind this requirement is that it will give the flagman more of an official appearance, and perhaps develop a greater sense of responsibility in him.

"The Highway Department has prepared a two-page folder with illustrations stipulating the methods by which flagmen shall direct traffic. Additional copies for job purposes may be obtained from J. P. Darrell, Traffic Engineer of the Department of Highways, and from project engineers.

"(4) A final development in this program has been the writing of a new special provision appearing for the first time in projects in the letting of June 16, 1950, providing a bid item on flagmen hours.

"The flagmen who are required under specification sections 1706 and 1707, and the flagmen specified for seal coat work, and also any other flagmen the Engineer considers necessary to provide satisfactory service to traffic, shall be furnished by the Contractor and this work will be paid for at the state's expense by the item Flagman Hours. These special provisions shall in no way relieve the Contractor of any of his responsibilities or liabilities under any of the provisions of the contract to perform the work safely and with the least interference to traffic.

"Flagman service furnished by the contractor shall conform to the regulations of 1708, together with the following requirements:

Each flagman shall be furnished and carry on his person a copy of "Instructions to Flagmen", published by the State of Minnesota, Department of Highways. It shall be the Contractor's responsibility to require flagmen to observe the rules and regulations contained in these instructions."

Some of Results

Indicating a definite lane for traffic through construction operations re-

duces confusion and the possibility of accidents. Seldom does even an inexperienced motorist get "stuck" in poor footing.

Inattention to proper sign position and maintenance creates public disrespect for all signals. Keeping signs and barricades in the immediate vicinity of the work and taking them down when no longer needed or pertinent for safe traffic control, has helped restore this respect for the meaning or the message of the sign itself. All of this impresses safety observance on part of the motorist, reduces accidents as well as the impatience of the driver over unavoidable delays or short stretches of slow speed where active construction operations are underway.

On all projects carrying any considerable amount of traffic through the work, the State includes an estimated number of flagman hours as a bid item. This removes the uncertainty of the amount of what formerly was a large incidental item of cost which contractors had difficulty in evaluating. The engineer and contractor cooperate in providing all the necessary flagging service that the construction conditions require. The contractor has no reason to get along with the minimum flagging expense formerly provided and the quality and alertness of the men now employed have improved.

It is anticipated that further continuous improvement will be experienced in our control of traffic. The safety complex can be maintained only by constant emphasis on all means legitimately employed to that end. The contractors, the construction engineers and the travelling public can all win at this game—if the rules are enforced and standard procedures are observed by all of us in this contest for safety.

Soil Testing for Engineers

"Soil Testing for Engineers," a new book written by T. William Lambe, published by John Wiley & Sons.

Dr. Lambe, assistant professor of soil mechanics at The Massachusetts Institute of Technology, first discusses general laboratory procedures and then devotes an individual section to each of 13 most common soil tests; covers apparatus, supplies required, discussion of recommended procedures, calculations, results, and a numerical example with data-calculation sheets.

The book includes chapters on tri-axial compression test on cohesionless soil, unconfined compression test, tri-axial compression test and direct shear test on cohesive soil. A 172-page, spiral-bound volume, priced at \$5.00. Address Roads and Streets Editor, 22 W. Maple St., Chicago, Ill.

Soil-Cement Base Construction

How a Tennessee county has used it to get durable, economical county primary roads

By E. C. Rodgers

County Engineer, Madison County,
Jackson, Tennessee

MADISON County in rural West Tennessee, county seat at Jackson, has an area of 563 square miles, and a population of 60,000. The county highway system consists of about 1,000 miles of rural roads, with traffic varying from 5 to over 600 vehicles per day. The roads are Primary, Secondary, and Land Use Roads. It is the ultimate aim of the county to pave about 210 miles of the primary and secondary roads and improve the grading and drainage on the remaining miles. All Secondary roads are to be surfaced with gravel.

The County is governed by a county court, composed of 26 elected magistrates. The court employs a qualified county engineer to direct the highway department and an advisory committee appointed from the court works with the engineer in matters of policies and programs.

The highway income comes from gasoline taxes, land taxes and bond issues. In 1949 the Tennessee legislature set up a Rural Road Program for improvement of county roads. This, along with the Federal Aid Secondary program, now furnishes us funds for construction projects.

Madison County contains no known deposits of stone, gravel or other materials suitable for road aggregate. Consequently, imported chert and gravel has been used almost exclusively for surfacing unpaved roads, and in some cases for base material for paved roads. Selected sand-clays are being used to surface light-traveled roads, with fair results.

The soils in the county are exposed sediments, composed of sand, clay, and a mixture of the two. Subgrades of improved roads have been mostly of a brown silty clay loam, with outcropping of sand, or heavy white clays or "soap stone." Soil analysis show gradations of 100% passing #10 sieve, 80-90% passing #40 sieve, 60-80% passing #200 sieve, with from 15-30% clay.

Condensed from a paper presented at the American Road Builders Association Annual Convention, March 21-25, Milwaukee, Wis.

In 1947 the county began a program under the direction of R. E. L. Odom. Soil-cement was used as a base with a bituminous surface treatment. Sixteen miles of road was completed. No paving was done in 1948, but this program was continued in 1949, under my direction. After investigation of various types of base available to me, I decided to continue the use of soil-cement for the following reasons:

1. Necessary equipment was owned by the county for this type of construction.

2. Due to lack of local materials, comparison of soil-cement with a gravel base showed soil-cement cheaper. A 6-in. compacted gravel base was estimated to cost about 70¢ per sq. yd.; a 6-in. soil-cement base, processed by county forces, 60¢ per sq. yd.

3. Evidence was available by inspection, of bases constructed previously in the surrounding areas, that soil-cement had withstood weather conditions better than the other types of bases.

4. Soil-cement would also be sufficient to carry all traffic imposed on the roads of the county by agriculture and industry.

Results from tests by the Portland Cement Association of the subgrade soils encountered, showed that the required cement would run between 10% and 12% by volume. Some re-

duction in this percentage could be realized on the roads where some gravel was already in place. It was not found advisable for economy to add gravel just prior to construction of the base. The addition of these admixtures would not substantially decrease the cement content required.

A standard paving width of 18 ft. was adopted, with grades and alignment designed economically to fit traffic conditions and the various types of terrain found in the county.

Construction Methods

In the 1949 summer I began my program with the construction of 8.2 miles of paving in two projects, using the following method of construction:

First, grading and drainage were completed, with a finished subgrade 26 ft. wide shoulder to shoulder, 2:1 ditch slope, 1'-6" ditch depths, and 1:1 back slopes.

Soil-cement base was then processed and a bituminous surface treatment was applied.

The following equipment was used in the processing of the soil-cement base:

- 1—Single Pass Mixing Machine (or stabilizer)
- 1—Cement Spreader
- 2—Motor Graders, W/Scorifiers
- 4-6—2-ton Trucks for Cement Haul
- 4-6—2-ton Trucks with 1200 gal. Water Tanks
- 1—35-ft. Belt Conveyor



★ Shaping the soil-cement mixture to final grade and crown



★ The county-built car unloader delivering bulk cement to trucks

- 1—60-hp. Crawler Tractor
- 1—Double-Drum Sheepfoot Roller
- 1—40-hp. Rubber Tired Tractor
- 1—Spiked-Tooth Harrow
- 1—Rubber-Tired Roller
- 1—1000-gal. Distributor

Personnel used in this construction consisted of one superintendent, one foreman, two tractor operators, two motor grader operators, one stabilizer operator, 8-12 truck drivers and 8 common laborers.

The subgrade to be processed in each day's work was prepared by scarifying to a depth of not greater than 6 in. by the motor graders to facilitate pulverization and mixing by the stabilizer. This operation is not absolutely necessary, but it resulted here in a saving of cutting teeth for the machine, and it increased production rate. Cement was then spread on this prepared sub-grade with the cement spreader, making 3 passes, spreading 6 ft. wide each pass. The cement was spread so that one-half the roadway, or 9 ft. could be processed for a distance of about 500 ft. Cement could then be spread on the remaining part of the subgrade while the first pass was being made with the mixing machine. The second half was then processed for the 500 ft. distance and for an additional 500 ft. This manner of organization prevented excessive turn-arounds and the last motion of backing the mixer. The cement spreader was pulled by the dump truck hauling the bulk cement. The truck bed was raised, allowing the cement to be spread by the continuous belt of the spreader. Three men were required for this operation.

Stabilizing Procedure

The mixing machine used required a minimum of labor and permitted a high production rate. Water was introduced into the mixture of soils and cement through the mixer. A water truck with connecting hose was at-

tached to the front of the mixer and pushed along during the processing. Pumps on the machine added water under pressure into the mixing box through spray bars. Water application was easily adjusted to obtain the necessary "optimum moisture content," (the critical amount for best consolidation). Two laborers were used with the mixing machine to connect and disconnect water trucks, set aligning poles, and level construction joints.

Sheepfoot Roller Pushed

Following the mixing machine, a sheepfoot roller pushed by a crawler tractor compacted the mixture, leaving about 1-in. depth of loose material for the shaping and spreading. A special hook was used to allow the roller to be pushed, instead of pulled, so that the roller feet could be the first to touch the loose mixture, and so avoid compaction in layers that would be caused by the tractor.

Following the initial compaction of the full width of the base, finishing operations were begun. We have found the distances of about 500 ft. can be finished at one operation and this process completed in a short time after the stabilizer is stopped for the day. A spiked-tooth harrow, pulled by a rubber-tired tractor was continuously used during final shaping to avoid compaction planes and to prevent "scabs." It also assured uniform compaction in the top layers of the base. The base was shaped to the final grade and crown by the motor graders. Water was added as needed by tank trucks with spray bars. The surface of the base was kept comparatively wet to give a smoother surface and to minimize the loose materials which are bladed to the shoulders during the final clipping.

After shaping the base was satisfactorily completed, the spike-toothed harrow operation was stopped and the

rubber-tired tractor began pulling an air-tired roller to complete the final compaction. The surface was continually watered as need, during this compaction. Emulsified asphalt was used for curing the base. After final compaction and just prior to applying emulsion, the motor graders lightly planed or clipped the surface to remove all loose materials or wheel marks made by the roller. The curing treatment was then applied with a 1000-gal. pressure distributor, using of 0.34 gal. per sq. yd. of asphalt emulsion and added water. This completed base was allowed to cure 7 days before it was opened to traffic.

Bulk Cement Unloading

An interesting feature of our operation was the method used in unloading bulk cement from covered hopper railroad cars. Previous to the beginning of my program, the county had rented an unloading plant from a local contractor. In order to conserve funds, I experimented with a 33 ft. belt conveyor. A homemade hopper was built that could be installed under the railroad track to confine the bulk cement and drop it on the conveyor. A metal cover was made covering the belt to prevent blowing by the wind, and a chute to cut waste at the point the cement spilled into the truck. This plant can be installed in four hours, by four men. All material used were on hand and no new equipment was purchased. This outfit loaded 8000 barrels of cement on a truck in three minutes. Tarpaulins were used over dump beds to prevent loss of cement en route to the job.

Production with these methods of construction and using county forces has been good. We obtained an average production of 6000 sq. yd. per 9 hour day, or approximately 1,100 sq. yd. per hour of mixing time with the stabilizer. Maximum production for my crew was 9400 sq. yd. in a 10 hour day.

Costs Very Low

The cost of 26.6 miles of completed base constructed since 1949, has been 60¢ and 65¢ per sq. yd., varying with the haul distances on each project. These projects include one built for the State Highway Department by county forces and one Federal Aid Secondary project. The rest have been financed by the State Rural Road Program.

Surface treatments used on these projects have been as follows:

1. Single bituminous surface treatment using .40 gal. per sq. yd. of asphalt cement and 40 lb. per sq. yd. of $\frac{3}{4}$ -in. cover aggregate.
2. "Double" bituminous surface

"Greatest Crisis"

in Traffic Safety Challenges All Agencies

treatment consisting of the aforementioned single treatment, with a seal coat of .25 gal. per sq. of asphalt cement and 20 lb. of $\frac{3}{8}$ -in. cover aggregate.

3. Mixed-in-place surface course, using a graded aggregate with a maximum size of $\frac{3}{4}$ -in. at the rate of 140 lb. per sq. yd. and 0.9 gal. of cut-back asphalt cement; 15-20 lb. of $\frac{3}{8}$ -in. cover aggregate applied.

Surface Treatment

I have found that the single surface treatment is not sufficient to withstand our traffic and weather conditions. The double surface treatment has been satisfactory for the majority of the projects and are wearing well. The mixed-in-place surfaces are ideal for my locality, but are expensive and are not warranted on most projects.

Maintenance records on all the soil-cement bases constructed in the county since 1947 have been remarkable. There is no evidence of any repair being made necessary by failures of the base. There is also no evidence of any depreciation of the existing bases. All projects have been exposed to traffic at least 30 days prior to the application of the wearing surface and some have been exposed throughout the entire winter. Any weak places caused by improper mixing, etc., are repaired prior to surfacing and these are not listed as maintenance costs.

Stood Cold Winter

Even more remarkable has been the comparisons between soil-cement and other types of construction as a result of recent freezing temperature, which went as low as 20 degrees below zero and remained below freezing for more than 2 weeks; no apparent damage has been done to the soil-cement bases of the vicinity, although all other types of pavements, including concrete slabs, have been damaged, some as much as 50%.

We are well satisfied with the performance of soil-cement, and expect to continue its use in our future program. Plans are now completed for the construction of 12.8 miles in 1951 and at least 15 miles in 1952. Highway personnel of other counties and the State of Tennessee are becoming more interested, due to our experiences in Madison County.

Traffic accidents named as national defense problem at Highway Safety Conference, where engineering problems shared place in broad program

TRAFFIC accidents, which took more lives in the past year than the Korean war, were tagged as a form of sabotage to our national defense effort, this timely thought keynoting the President's Highway Safety Conference held June 13-15 in Washington.

Traffic accidents cost the nation over three billion dollars annually, noted President Truman in his Conference address. Traffic injuries during 1950 totalled 1,035,000, and deaths over 35,000. The death total has crept up again after a brief wartime and post-war drop, being explainable largely by the rise in vehicle registration between 1945 and 1951 and the even higher rise in vehicle travel mileage, now also at an all-time high.

The fatality rate of 11 per hundred million vehicle-miles, which existed prior to the founding of the Conference in 1946, fell sharply to around 7—a dramatic fact which can clearly be credited to the organized effort by all governmental agencies, citizen groups and individuals, every day, everywhere, as outlined and stimulated by the Conference's "action programs." The rate stood at 7.1 for 1949 and is little changed today, the death rates for individual states however varying greatly.

The President's message, given at the Conference's opening general session and nationally publicized, included the statement, "for nearly twenty years highway improvement programs have lagged far behind our needs. Much of our main road mileage is worn out and obsolete." He warned that it is a mistake to consider the highways expendable in the emergency period. The defense effort depends on the efficient movement of goods and people over the nation's highways.

Maj. Gen. Philip B. Fleming, who again headed the conference as general chairman, was presented by the President with a plaque as a token of appreciation for outstanding public service. Mrs. Fleming received the plaque for the general, who was ab-

sent due to illness.

The Safety Conference as usual consisted mainly of group meetings. Thos. H. MacDonald, commissioner of public roads, as head of the coordinating committee and chairman of the conference reports committee, spoke briefly at the opening session.

The Engineer's Role

Of most immediate interest to engineers and contractors is the strong effort being made through this group to explore the whole field of highway engineering from a traffic flow and accident prevention standpoint.

The Conference Committee on Engineering sponsored an all-morning open forum discussion entitled, "Exploring Weaknesses to Guide Engineering Solutions." Moderator was Gibb Gilchrist, Chancellor, Texas Agricultural and Mechanical College, the committee's chairman. G. Donald Kennedy, Consulting Engineer, Portland Cement Association, was discussion leader, with Charles W. Prisk, secretary. Forum consultants or panelmen representing many types of organizations included Donald S. Berry, Institute of Transportation and Traffic Engineering, University of California; William J. Cox, Consulting Engineer, Leesburg, Va.; Jerome S. Hardy, Director of Advertising, Doubleday & Co., New York; Roy E. Jorgensen, Engineering Counsel, National Highway Users Conference, Washington; Burton W. Marsh, Director, Traffic Engineering and Safety Department, American Automobile Association; Burton Marye, Jr., Assistant Chief Engineer, Virginia Department of Highways; O. K. Normann, Chief, Traffic Operations Section, Bureau of Public Roads; and Lloyd Reid, Commissioner, Department of Traffic Engineering, New York City.

Among the noteworthy bits of thinking and factual data to come out this session, a few are jotted down herewith:

Traffic is accorded a high place in the organization of the California division of highways, according to J. C.

Young, traffic engineer. The traffic division, in contrast with the set-up in many other states, has charge not only of traffic control (signals, signs, markers, etc.), but also of geometric design standards, the highway planning survey, and accident research analysis. Some 250 personnel are thus integrated into the highway department, in a manner which is considered to be highly successful in that state.

Accident Location Data

William J. Cox, consulting engineer and formerly highway commissioner of Connecticut, discussed Mr. Young's remarks, noting that while engineers in other states may disagree with the California scheme, they all agree that traffic men should have a voice in highway design from the standpoint of accident prevention and efficient traffic handling. "Traffic thinking" must be permeated into all parts of the highway organization today, since roads exist for traffic. In some highway departments a tendency exists for the design division to work with insufficient cooperation with the traffic and maintenance divisions.

Carl Fritz, Vice-President, Automotive Safety Foundation, reviewed the Foundation's recent work in cooperation with the Virginia Department of highways. The approach taken was to see what can be done with limited finances, technical manpower and materials to best improve the existing road system, which is over-crowded and over-age. The plan was to single out parts of the highway system and recommend something less than the ultimate improvement, thereby raising the level of total public service. A limited number of highway sections was selected, each of which is being studied by Foundation engineers who are considering both the "ultimate" and the "expedient" solution.

The problem of accurately locating the position of rural highway accidents in routine reporting evoked lively discussion. R. H. Baldock, state highway engineer of Oregon, said that in his state all accident reports from the police clear through the highway department's traffic engineer. He in turn sends the data to the maintenance engineer, who keeps a pinhead map in his office showing accident prone locations as a key to possible repairs, minor straightening at curves, and other measures which might eliminate hazards at little cost.

Accident location reporting was a problem faced in Connecticut where the highway department has worked in cooperation with the motor vehicles division to get all data possible. The department has inventoried all utility

poles, which are entered on line diagrams. Motors are encouraged to refer to nearest poles by number in reporting accidents. Reports are referred back to the vehicle authorities for further checking on location, when necessary.

Maryland state roads commission has simplified accident location reporting through establishment of numbered maintenance stations at 0.1 mile intervals throughout the highway system. These stations are recorded on a map scaled 5 miles to the inch. These map sheets aid in correlating accidents with maintenance and repair work.

Warning on Widening

The importance of correcting basic safety defects when widening and resurfacing old pavements, was voiced by W. F. Childs, Jr., Chief Engineer, Maryland state roads commission. These hazards have not always been corrected during such work, with the result that the increased traffic volume invited by the improvement may result in further accidents. Thought should be given to filling the inner edges of curves, increasing vertical as well as horizontal sight distances, etc. Of special importance is the acquisition of additional right-of-way width when widening a pavement, so that ditches can be set back and proper shoulder width maintained. Many widened roads take the traffic alongside dangerously close and deep ditches because this detail was neglected.

How a city can sharply reduce accidents at some intersections was told by Leslie Sorenson, Traffic Engineer, Chicago. Noting that pedestrian accidents are the most numerous in cities, he said that his department analyzed certain intersections where the records were particularly bad. One example was a 3-street junction carrying 42,000 vehicles per day. Street cars and buses loaded and discharged passengers at an island in the intersection, forcing all passengers to cross one or more streets to get to the sidewalk. An immediate 71% reduction in accidents resulted from requiring all transit vehicles to load at outside curbs, relocating traffic signals, eliminating curb parking near the intersection, and setting back curbs near the intersection.

Get the Facts

Often "minor" things can be detected as the means of greatly reducing accidents with relatively small investment, noted Mr. Sorenson, who said that Chicago is laying out a 5-year accident record keeping an analysis program for arterial streets.

O. K. Norman, Bureau of Public

Roads, noted the importance of gathering adequate and systematic facts, as a means of enabling engineering to take precedence over uninformed public opinion. He also noted that highway operation has belatedly come to rank in proper importance along with physical construction, in administration and on down through the highway department's specialized activities. Roads may be structurally sound, yet obsolete.

Safe work in the form of channelization and other measures to aid pedestrians was told by Howard Ilgner, Milwaukee. This city is a pioneer in channelization, having used it extensively for a quarter century. This spokesman noted that pedestrians haven't a chance to cross some wide arterial streets safely, because of the signal progression or signal intervals which result in one side of the street or the other always having traffic past a given point. A main street with signals at say half-mile intervals may need center islands at the intervening intersections.

The Conference's Committee on Engineering prepared a 12-page "Guide for Discussion" for use at the Conference meeting. This summary lists the deficiencies and obstacles to fuller use of the engineering tools now available to help make highways safer. A copy of this summary can be obtained by addressing the President's Highway Safety Conference, General Service Building, Washington 25, D.C.

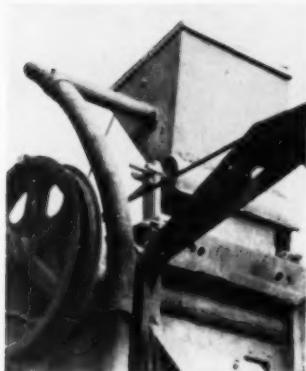
In the year 1950, there were 4,000 highway-railroad grade-crossing accidents, or 13.5 per cent more than in 1949. The number of deaths, 1,576, was 4.6 per cent greater and the number of persons injured, 4,368, was higher by 15.7 per cent, according to the Interstate Commerce Commission.

Meetings Ahead

AMERICAN PUBLIC WORKS ASSOCIATION—Annual Public Works Congress and Equipment Show. Veterans' Memorial Building, Detroit, Mich.; September 16-19.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Annual Meeting, New York City; October 22-26.

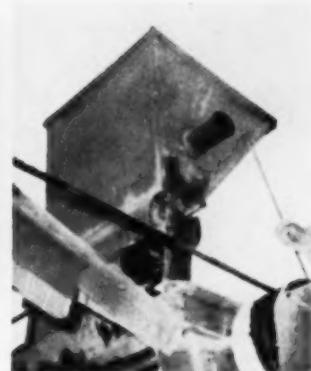
AMERICAN CONCRETE INSTITUTE—Regional Meeting, Sheraton Hotel, St. Louis, Mo.; October 30-31.



★ The curved pipe rising through the foreground of this picture and leading into the hopper is an extension of the exhaust pipe from the mixer engine, used to keep hopper contents dry



★ Immediately to the right of the curved exhaust pipe is seen an "F"-shaped arm attached to the skip. This arm opens and closes the cylindrical container which holds a measured quantity of calcium chloride



★ This picture shows end of exhaust pipe. Directly below pipe note cylindrical container which holds a measured quantity of calcium chloride

Chloride Feeder Supplies Paver Drum

IN construction work which uses concrete, calcium chloride is generally added to the concrete mix in dry flake form. In most cases the flake chloride is added to the mix by hand in a container which holds the required amount of calcium for each batch of concrete.

The Calcium Chloride Association has sponsored development of a feeding device which automatically drops a measured quantity of flake calcium chloride directly into the concrete mix.

Maxwell C. Rawson, Equipment Engineer in the District of Columbia, designed and supervised manufacture and installation of the first working model, which was used on a 34-E Ransome paver on the Dupont Circle underpass. Subsequent plans for the device include its installation at a ready-mix plant.

Simple Design

The device consists mainly of a V-shaped hopper which holds 350 lb. of calcium chloride. The contents of the hopper feed into a cylindrical container at the bottom of the hopper, and the container's gravity flow can be adjusted by means of removable wooden plugs. In normal position, the container is filled from above through an opening in line with the bottom outlet of the hopper.

When the lever on the cylindrical measure (or container) is moved, it

revolves the cylinder; this action closes the feed outlet of the hopper. When the opening is turned towards the bottom of the hopper, the measured quantity of flake calcium chloride is dropped directly into the paver drum.

The activating lever on the side of the cylinder is opened and closed by normal movement of an "F"-shaped arm attached to the skip. This "F"-shaped arm is so designed that when the skip is raised to drop aggregate into the paver drum, the arm will automatically trip the cylinder lever, revolve and open the measuring cylinder, permitting the calcium chloride to drop into the paving drum. As the skip is low-

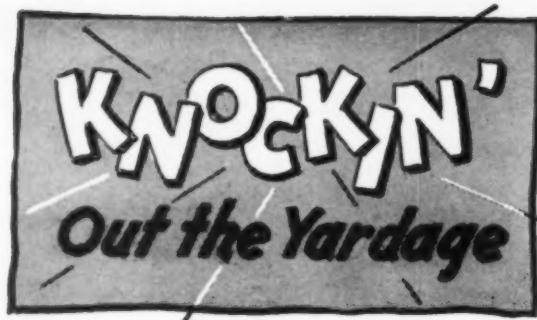
ered to its original position, the "F"-shaped arm revolves the cylinder into its normal closed position.

The contractor's superintendent, William Raines, reported that the device worked satisfactorily on the Dupont Circle project. He was reported as being pleased with the automatic features which provide positive control for addition of calcium chloride, and simplification of the mixing operation which results in a saving of labor. The only labor needed was that required for filling the hopper with calcium chloride each time its contents have been used. No particular attention was required in order to assure that each batch of concrete would contain equal quantities of calcium chloride.

As the accompanying pictures indicate, the device is simple in design. It may be made at low cost in a machine shop. Blueprints are available on request to the Calcium Chloride Association, Ring Building, 1200 18th St., Washington 6, D.C.

★ Automatic device seen in use on a Washington, D.C., underpass project.





Good Yardage on W. L. Harper Job

As high as 8,000 cu. yd. of earth moving in a 20 hour working day, with 6,000 ft. average haul from the borrow area, was accomplished during the 1950 season by the W. L. Harper Company, contractors, of Cincinnati, Ohio. John H. Harrison, superintendent. The job was a flood protection earth levee, built for the U. S. Engineers at Marysville, Kentucky. The levee was built 4,000 ft. long and 22 ft. average height.

A few main quantities for this project: 500,000 cu. yd. of earth; 1,400 cu. yd. structural excavation; 140 cu. yd. culvert concrete; 6,500 cu. yd. stone rip-rap slope protection; 1,300 lin. ft. of 30-in. concrete pipe.

The equipment consisted mainly of 2 Model TS-300 LaPlant-Choate motor scrapers; 2 DW-10 Caterpillar scrapers; 5 Super C Tournapull scrapers; 2 No. 12 Caterpillar motor graders; 2 D8 Caterpillar bulldozers; 2 D7 Caterpillar bulldozers; 1 TD24 International tractor (pusher); 1 Model 6 Northwest dragline.

Alpine Construction Co. Moves 500,000 Yd. of Sand in 100 Days

Sand can move fast, or it can slow up a job, "depending." A speedy per-

formance in sand was reported for Alpine Construction Co., of St. Ignace, Mich., on a road project last year. The work consisted of grading, drainage, structures and aggregate surfacing on 6.41 miles of Michigan Route M-115.

Quantities included 31 acres clearing and grubbing; 565,000 cu. yd. earth excavation (with considerable overhauling); 200 cu. yd. culvert concrete; 9,000 ft. of culvert pipe; 100,000 sq. yd. of sodding and sloping; 20,000 sq. yd. of gravel surfacing.

- The best day's output of 7,500 cu. yd. in 8 hours was performed with a fleet consisting of one 3½-yd. dragline feeding to 5 bottom-dump wagons; 5 self-propelled scrapers; 2 18-yd. scrapers; 7 tractors with dozers or pusher equipment. Equipment included Euclid, LeTourneau, Cater-

pillar, International, Allis-Chalmers and others.

Ironically, after whizzing through the first 500,000 cu. yd. of sand material in a little over three months, the remaining 65,000 yd. which ran more to clay took another 60 days because of weather conditions, according to a spokesman for the contractor.

One-Half Million Yards Moved on Mississippi Relocation

A 12½ mile highway relocation job on route 25, north of Amory, Mississippi, by Worsham Brothers contractors involves a half million yards of dirt moving.

A fleet of Allis-Chalmers tractors with dozers and scrapers are handling the heavy earthmoving. There are two Allis-Chalmers HD-19's pulling Gar Wood 625 scrapers; one HD-19 as a pusher; four HD-10's with Gar Wood 511 pans; one HD-10 as a pusher; one HD-10 with Gar Wood dozer; one HD-5B with a Gar Wood dozer, and three Allis-Chalmers AD-4 motor graders.

Frank Worsham, Contractor, says, "We moved this outfit into one cut and moved 13,010 yards in one 10 hour shift on an average haul of 350 feet." He further emphasized that this is the "best dirt moving record we have ever made." Leroy Worsham was in charge of the job.



★ Part of Worsham Brothers' fleet which moved 13,010 yds. in 10 hr. shift.



★ A 6,000 ft. haul gave the scrapers a chance to "spread their wings" on the W. L. Harper job



★ Dozer helping feed dragline on the levee project; Worsham Brothers, Contractors



Fast Going on 17,000 Ton Hot Mix Job

Typical of the high-geared operations which help produce the huge mileage of completed roads in North Carolina during 1950 was the performance of the Brown Paving Company of Lexington, N. C. This contractor had a job involving 24.7 miles of county roads, surfaced with 1 in. thickness of bituminous concrete 18 ft. wide. 17,000 tons of hot mix was required. Work included placement of 6 in. depth of exceptionally good base material, disintegrated granite found in the locality. This base, however, was placed by the labor forces of the highway department.

As high as 850 tons of mix per day was produced by an outfit consisting of a Cedarapids hot-mix plant, Simplicity system model A drier, Barber-Greene finisher and Galion rollers.

In discussing this project, a representative of this construction company noted that people in other states might question the soundness of placing such a thin carpet of mix. The single 1 in. course was placed as part of a scheme in the state to cover as many miles of secondary roads as possible where the traffic is light, with a surfaced design primarily to get the farmers out of the mud and dust.

The project was completed in the early months of 1950 and after a year of use has shown good durability with virtually no areas of failure.

Develop New Soil Selection Technique

A soil selection method which will enable contractors to save valuable time in construction of highways, air field pavements, earthen dams, and other earth utilizing structures has been developed in research on Project No. 199 (Rapid Sample Preparation Methods for Soil Selection in Road Construction) of the Texas Engineering Experiment Station. The new method employs methyl alcohol, (which has the property of rapid evaporation), to break down the bond between soil particles.

As described in "Highway Research Abstracts," April, 1951, existing methods are based on standard soil tests which require up to three days for completion, particularly in the case of fine grain soil such as clays.

The methyl alcohol soil selection method is based on a rapid soil moisture test which was described in Research Report No. 9, Texas Engineering Experiment Station, "A Rapid Method for Determining the Moisture Content of Soils," by Albert J. Bonar. In addition to a methyl alcohol, it requires basically the same equipment as the ASTM method: No. 40-mesh sieve, 3-quart sauce pan, liter beaker, spatula, small trowel, 10-in. by 15-in. metal cookie baking sheet, gas or electric hot plate, and a short length of small diameter rubber hose.

Procedure of the alcohol soil selection method is simple and does not call for specialized attention. A representative soil sample is taken by quartering or use of a small splitter. It is placed on the sieve which in turn rests on the bottom of the sauce pan. A liter of methyl alcohol is poured slowly over the soil, and the mixture is agitated until the binder has slaked and passed through the sieve. The sieve is raised from the bottom of the pan to allow draining. The pan is tilted for a few minutes to enable the binder which has collected in it to settle on one side. About half of the

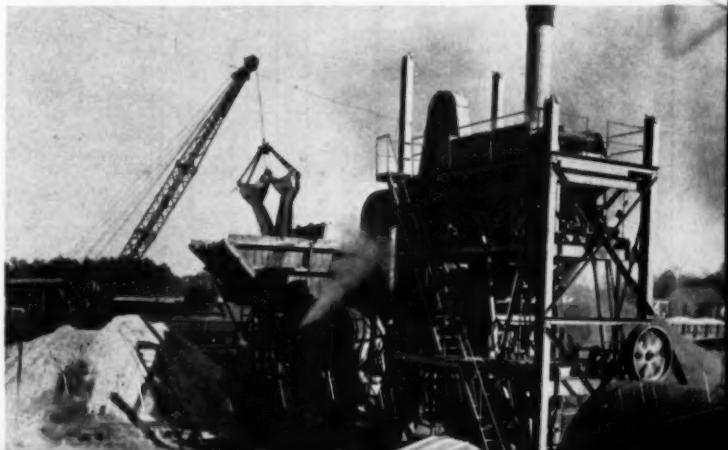
alcohol water mixture from the pan is siphoned into a beaker. The material on the sieve is re-washed with the siphoned mixture until a reasonably clear wash is obtained. After final siphoning, the remaining soil-alcohol-water mixture is then poured onto a cookie sheet and placed over a hot plate. The soil sample is then stirred until it is dry. The previously siphoned alcohol is filtered through paper, and the soil remaining is dried and added to the dry soil sample on the cookie sheet.

A variety of typical soils were tested by both the established method and the alcohol method. These gave favorable evidence for the alcohol method with regard to separation and drying. The effect of alcohol separation on the Atterberg Limits is negligible, and no trend is indicated.

A detailed account of the experimentation on the new soil-selection method is given in Research Report No. 20 "Rapid Sample Preparation Method for Soil Selection in Earthwork Construction" by Bob M. Gallaway.

On June 28 and 29 this year, the Pennsylvania Department of Highways opened bids for 39 projects covering 131 miles of roadway. This is a record for mileage and number of jobs at a single letting.

★ The hot-mix plant employed on the county road job by Brown Paving Company



Distribution Charts for Stabilization Materials

HYDRATED lime, portland cement and asphalt admixtures are being specified at installations in the U. S. Fourth Army area to increase the quality of base materials. Satisfactory performance of stabilized bases is dependent on the proper solution of the problems of insuring that areas designated for treatment, whether large or small, wide or narrow, receive the correct percentage of admixture as determined by laboratory tests. Field calculations to determine spacing of sacks or rate of application of base stabilization materials on regular sections of highways or airfields is a comparatively simple problem, but streets and parking areas with their variable widths require numerous field calculations and changes.

To simplify these calculations and reduce the element of error, charts have been prepared in the Roads and

Railroads Branch, Engineer Section, Headquarters Fourth Army, from which inspectors and foremen can readily determine the desired distribution of materials. Examples given on the charts explain the calculations.

When to Stabilize

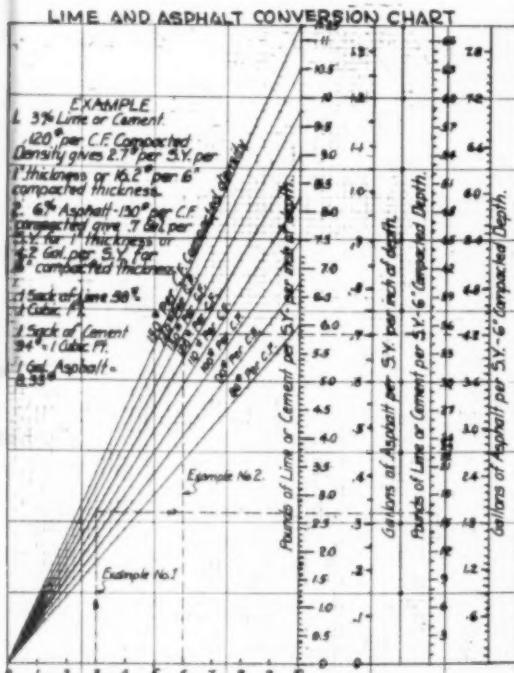
In past years, especially on the older installations, road materials were utilized from local sources at random. Frequently these materials were used as open gravel surfaces for years and then covered with asphalt. Due principally to the variation in quality of these base materials, keeping these pavements serviceable is an expensive and endless job on which considerable study has been made. On some pavements it has been found more economical to remove the old material and replace it with new, but in many cases stabilization of the

existing materials by admixture of asphalt, hydrated lime, portland cement, or a combination of cement and lime, is found more economical.

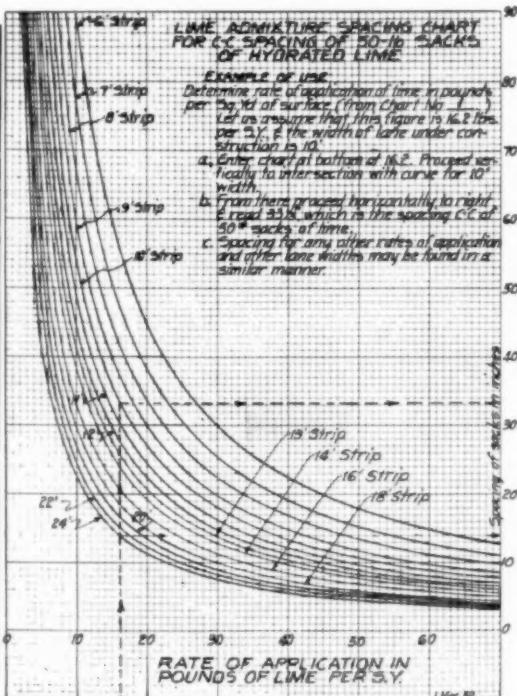
Samples Analyzed

Where trouble is experienced with defective bases in the Fourth Army Area, laboratory analyses are made on samples from the defective areas to determine the most satisfactory and economical method of correction. If stabilization is decided upon, data on the amount of admixture and the optimum density of the stabilized material are furnished the supervising pavement maintenance personnel. From this information and the applicable charts, the rate of distribution of asphalt per square yard, or the spacing of sacks of cement or lime can be determined for any width and depth of section.

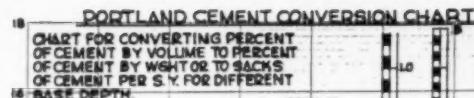
This work is under the jurisdiction of Colonel R. E. Smyser, Jr., Fourth Army Engineer; Dennis E. Griffith, Chief, Buildings and Grounds Sub-section; and Maynard G. Fuller, Chief, Roads and Railroads Branch. The charts were developed and prepared by Gordon W. Dabney, Assistant Chief, Roads and Railroads Branch.



★ Chart 1. Percent by weight based on weight of compacted stabilized base, shown by figures 1 to 10 under left side of this chart. Right side is a soil stabilization chart for lime, cement or asphalt.



★ Chart 2. Rate of application, in pounds of lime per sq. yd. (figures 0 to 70 below)



EXAMPLE
10% of cement by volume of dry density of 120/l per C.F. from chart = 8.5% by weight of 6 sacks per S.Y. for 6" compacted depth.

★ Chart 3. Percent of cement by weight of over-dry soil or base material (figures 0 to 10 below)

Illinois Gets More Road Funds

After several years of battling the Illinois state legislature recently enacted important new highway legislation. This law signed by the Governor in July, will:

1. Increase the gasoline tax rate from 3 cents up to 4 cents, beginning Aug. 1, 1951, and to 5 cents beginning Jan. 1, 1953.

2. Boost the schedule of truck license fees in a manner which assures an additional \$20,000,000 from this source beginning Jan. 1, 1952, and a further \$8,000,000 beginning Jan. 1, 1954.

The bill represents a compromise, pushed through during the closing days of the legislature after six months of debate. The table shows the probable amounts of new money that will accrue as a result of the bill (in millions of dollars):

	Remainder of '51	1952	1953	1954
State	\$1.7	\$24.2	\$35	\$45
Counties	1.7	4.2	3	3
Townships	3.1	7.5	10	10
Cities	1.7	4.2	12	12

These figures show increases over present revenues, based on an estimated \$80,000,000 annual income from the 4 cent gas tax and \$100,-

PORTLAND CEMENT SPACING CHART

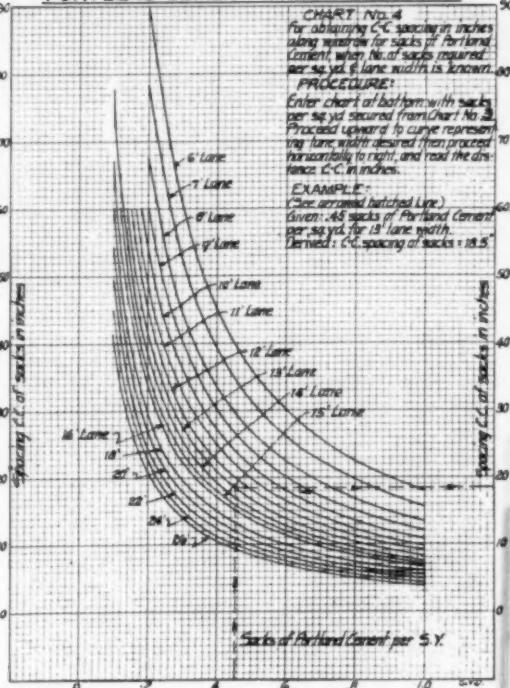
CHART NO. 4
For obtaining S.C. spacing in inches along width for spaces of Portland Cement when No. of sacks required per sq. yd. & lane width is known.

PROCEDURE:

Enter chart at bottom with sacks per sq. yd. secured from Chart No. 3. Proceed upward to curve representing lane width desired then proceed horizontally to right and read the distance C.C. in inches.

EXAMPLE:

(See arcuated hatched line.)
Given: 46 sacks of Portland Cement per sq. yd. for 18' lane width.
Derived: C.C. spacing of sacks = 18.5"



★ Chart 4. Portland cement spacing chart: sacks of cement per sq. yd. vs. spacing of sacks

Technical Literature

"AN ANALYSIS OF THE HIGHWAY PROGRAM," by Roy E. Jorgensen, Highway Engineer. Another extremely interesting and valuable summary of highway economics, prepared by the National Highway Users Conference, Inc., National Press Building, Washington 4, D.C. Available free on request.

"REFLECTORS AND NIGHT VISIBILITY." Bulletin No. 34, Highway Research Board, May, 1951. Consists of 24 papers sponsored by the committee on this subject and presented at the 29th annual meeting of the Highway Research Board. Available without charge to members of the Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C.

"ROADS TO NATIONAL SECURITY." An excellent popular and pictorial summary showing the importance of highways in our national life, with charts, graphs and much valuable data. An excellent summary of the case for highways in these times. For free copy, address National Highways Users Conference, Inc., National Press Building, Washington 4, D.C.

Radio Committee Report

Shows 62 highway departments now served by 2-way radiotelephone

Excerpts from a report of the AASHO Committee on Use of Radio in Highway Departments, presented at the recent Miami convention. For a copy of the complete report, write the committee secretary, H. A. Radzikowski, chief, Maintenance Branch, Bureau of Public Roads, Department of Commerce, Washington 25, D.C.

THE use of radiotelephone as an aid in the management of mechanized road maintenance operations and in providing better and safer highway service is increasing.

There are now 25 county and 37 state and municipal highway departments listed by the Federal Communications Commission as having received, or as being in the process of securing a permit to use radio frequencies for communication purposes in highway operations.

Six other highway departments—the States of Massachusetts and Minnesota, the New Jersey Turnpike Authority, Los Angeles and San Diego Counties, California, and the City of Syracuse, New York—are making field surveys, preparing specifications, or have made inquiries for estimating available frequencies for estimating or budget approval purposes.

Detailed data received from 40 of these highway departments disclose that they have a combined radiotelephone coverage of 709,784 square miles and 129,075 highway miles. Along those highways, mobile road maintenance equipment with radio receiver installations can be contacted at the speed at which light travels. The committee report includes a detailed list of user departments and their facilities, and also 11 case examples of the utilization of 2-way radio in road management.

The advantages of radio are summed up as follows:

1. Reduction in operating time losses from equipment breakdown. More direct supervision by State and county engineers.
2. Reduction in paper work may pay cost of radio equipment.
3. More effective equipment utilization and teamwork between county road districts.

tion and teamwork between county road districts.

4. More effective equipment parts inventory control.

5. Good will through prompt service to highway users.

6. Time saved by direct reporting on job.

7. Time saved in amount of manpower used.

8. Lives saved in emergencies.

9. Reporting of road snow and ice conditions to the general public.

10. Improved towing service on bridges.

11. Radio in highway planning.

Evaluations of the usefulness of this communication media by the highway departments operating radiotelephone, indicate that while originally radio was associated with winter snow operations, now with the more liberal FCC Rules for Public Safety Highway Use, it is very effective in year-round coordination and integration of mechanized highway operations.

Maintenance activities are dispersed over the State, county or city-wide highway system and the mechanized units are constantly changing position. Radio has made possible direct contact at all times and in all kinds of weather.

Cost of Radio

Some of the state highway departments are in the process of installing a state-wide communication system. Others are operating in only a part of their State.

California: Cost of acquisition and installation to date, including installation in 6 of 11 districts, plus purchase of equipment only for three additional districts, as \$450,000. They have 253 mobile, 43 base, 14 repeater and 16 control stations. Their final plans call for 100 main stations and 350 mobile units. This system is to be owned and operated exclusively by the highway department.

Arizona: Estimates that system will cost \$300,000; \$50,000 expended to date for installations. Upon completion, state-wide coverage will be provided for the highway department, the highway patrol and the county sheriff. Each, upon a separate frequency, will be able to intercommunicate with the others.



★ Example of increased use of radio for general maintenance. A Washington State Highway Department maintenance supervisor near the top of Blewett Pass, using mobile F.M. 2-way radio to request asphalt mix for road repairs. (Photo by Motorola, Inc.)

Steel Scrap is Very Scarce!



You have given your sons to the Armed Forces

You have devoted your plants to the defense effort



You have joined Civilian Defense

You have bought Defense Bonds...given your blood



Now...will you turn in your scrap?

**Without vital scrap, the steel so desperately
needed cannot be made.**

Round up your scrap—call in your scrap dealer TODAY!



The Colorado Fuel and Iron Corporation



AMERICAN WIRE FABRICS CORPORATION, Mt. Wolf, Pa.

CLAYMONT STEEL CORPORATION, Claymont, Del.

THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, Calif.

WICKWIRE SPENCER STEEL DIVISION, New York, N.Y.



★ Snow plow operator acknowledges orders to move to a new location over his mobile F.M. 2-way radio. (Photo by Motorola, Inc.)

Oregon: System shared with the State police but owned and operated by the Highway Commission, has cost approximately \$100,000 to date. Will cost \$300,000 within the next two years, including equipment on order and depending on materialization of plans.

Washington: Owned and operated by the highway department for their exclusive use; estimated cost \$250,000; 62 cars, 56 trucks and 21 snow plows operating on this system.

On the small systems operated by some of the counties, the cost is reported quite low. One county, operating one base station and 16 mobile units with a coverage of 1,461 square miles and 912 highway miles, reported the cost of acquisition and installation of the radio system as \$15,612.76. Another county, operating 7 mobile units and 1 base station, with a coverage of 1,300 square miles and 927 highway miles, reported a radio system cost of \$9,358.65. The variation of cost, of course, depends on the density of population and traffic in the county and the number of mobile radio installations necessary for proper traffic and highway service.

One county divided the annual cost of operating radio, including equipment depreciation, by the number of people living in the county. It resulted in an annual cost of eight cents per person, which the county considered in the nature of an insurance for the purpose of being able to call snow removal equipment promptly to the farmer's door in case of emergency.

Another county in the East reported a cost of \$4.25 an hour for the operation of a total of 32 two-way mobile units, 22 one-way receiver units and 1 base station. This hourly charge included interest on investment, depreciation of radio equipment over 5 years, cost of repairs, land telephone line and cost of power for operation. It amounts to about 8 cents per hour per radio unit. The county highway department engineer commented that it is understandable in operating a fleet of 100 trucks, besides various other equipment, that the *rental value of one truck would easily be saved every day in the year through management by radio.*

It may be possible to decrease the cost of radio per road equipment unit operated, through the use of some of the more modern radio sets designed by manufacturers. Road equipment can be fitted with racks, and a radio unit quickly transferred from a vehicle that is to be garaged into a vehicle that is going out on the road. Such transfers can be made between winter snow equipment and summer oiling equipment and between supervisors and road mechanic's cars. One county reports the use of about 1½ vehicles per radio unit.

Short Antennas Wanted

The Committee has had some inquiry about radio towers. The tallest tower in use by a highway commission is a self-supporting, 400-ft. tower in Kansas. The State reports that it costs more than the guyed tower but believes the upkeep will be less over a period of years. The South Carolina Highway Department is erecting a 340-ft. tower. There are also several Wisconsin counties using 300-ft. self-supporting towers.

While the taller the tower the greater is the radius of radio coverage, some highway departments try to avoid tall towers. Tall towers are expensive to properly construct, repaint, maintain, etc., as antenna heights of 150 ft. or over require aeronautical beacons, obstruction lights, painted warning stripes, etc. It often appears from map studies that an extremely high antenna will be required to serve a given area, whereas a later field test of the area with mobile units and a short temporary antenna located on the site of the permanent antenna indicates a height of half or less of the map height to be adequate. Again these field tests often indicate that a shorter antenna, in combination with a repeater station, will cost less and give more coverage than one extremely high antenna.

California erects some antenna tow-

ers on tops of their buildings where possible, in order to hold construction costs at a minimum; latest installation at Sacramento is an 80-ft. section-welded, rectangular, guyed, television type of tower. With a power-gain antenna on top of this tower, plus building height, a ground height of 148 ft. was obtained, permitting a 250-watt transmitter to "work" Eureka 214 air miles, Garberville 170 miles, Donner Summit 90 miles and many other base and mobile stations.

With respect to cost, a self-supporting tower of about 300-foot height is, in general, approximately twice that of a guyed tower of equal height.

While good progress is being made, the principal problem still confronting the AASHO Committee on the Use of Radio in Highway Departments is frequency coordination.

The FCC has issued Revised Rules Governing Public Safety Radio Services (Part 10), effective July 1, 1949. The new rules provide the following:

1. It recognizes highway maintenance services as public safety services; same category as police, fire and forestry conservation.

2. It permits highway departments to use radiotelephone for communications directly relating to public safety and protection of life or property, or essential to official activities directly relating to the maintenance, supervision and operation of public highways.

3. It provides frequencies in the 46 to 47 megacycle band, for the principal use of State highway departments, based on a geographical assignment plan. These frequencies may also be used by the counties with State approval.

Frequencies in the 33 to 37 mc. bands are also provided for cities, counties and townships. Other frequencies are provided in the 156, 157, and 159 mc. bands upon a showing of non-interference.

4. The Rules also authorize the highway maintenance radio service to intercommunicate with other stations in the Public Safety Service, namely police, fire, and forest-conservation radio service.

A fundamental problem in the development of an efficient highway radio communication service is the selection and securing of a radio frequency that will furnish minimum of interference from and to other radio users. A radio frequency may be compared to a party telephone line clear across the Nation.

The need for adopting a coordinated frequency assignment plan for the counties and cities in a State, to secure an orderly development of this highway communication media, is obvious from the quoted FCC Rules and correspondence. Such plan should be developed at an early date in order that the counties may secure frequency assignments with minimum interference.

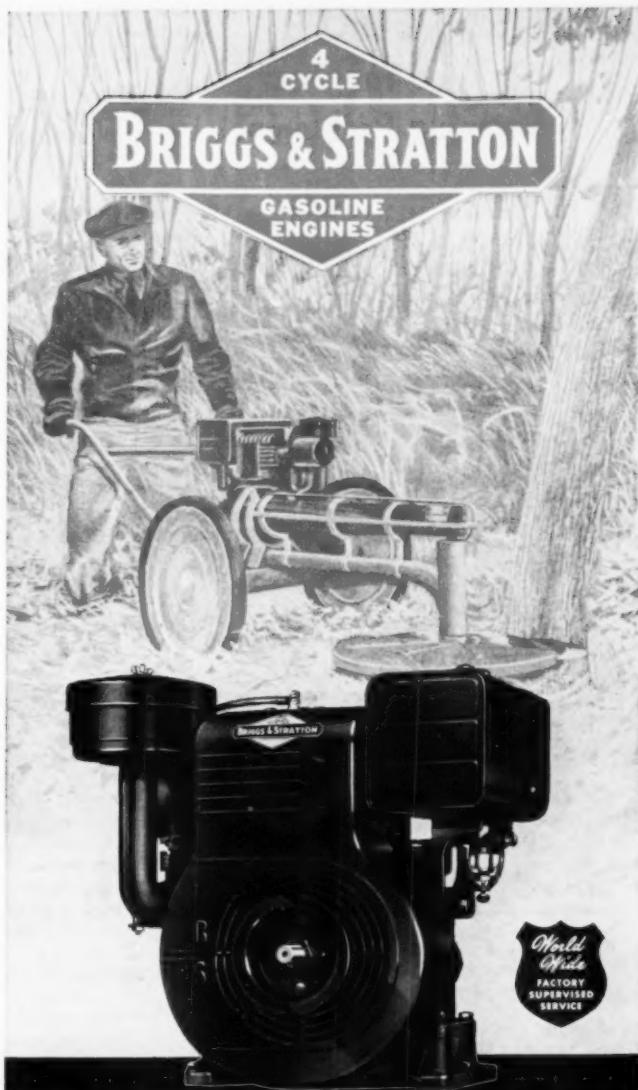
Frequencies in the 46 to 47 mc. band which have been assigned to the State highway departments may be available to counties on State approval.

Frequencies 33.02 mc. and 37.98 mc. have been generally applied for and assigned to counties and city areas in various parts of the United States: Michigan, New Hampshire, New Jersey, New York, Ohio, Wisconsin, and Washington. It has also been indicated that frequencies 33.06, 33.10, 37.90 and 37.94, which are shared with special emergency services, may be available to county highway departments under certain conditions. It is with these frequencies that an assignment plan should be decided.

The radio committee consists of four members, a secretary and a consultant. Each member is chairman of a regional subcommittee, which consists of members from each State. The four regions are: (1) Western, (2) South-eastern, (3) Mississippi Valley and (4) North Atlantic States. The State highway department frequency applications clear through the State highway department representative on the regional committee because of the availability of the frequency assignment plan in the 46-47 mc. band. With respect to county and city highway departments, requests for frequencies in the 33-37 mc. bands, where no recognized frequency assignment plan exists, they must clear through the regional committee chairman or secretary. This county and city highway assignment plan should be developed at an early date.

Each State highway department has been assigned two frequencies in the 46-47 mc. band. Highway maintenance base stations under FCC Rules are primarily authorized to use these frequencies to intercommunicate with highway maintenance mobile stations. Highway maintenance mobile stations are primarily authorized to intercommunicate with base and other highway maintenance mobile stations. There exists a problem when State highway departments desire to use a third frequency for secondary base station-to-base station communication. Several highway departments have sought the use of frequencies in the 70 mc. band but these are being occupied by the television industry. Experimental frequencies are being made available.

The FCC has been most cooperative in the work of the AASHO Radio Committee. It has, at all times, demonstrated a desire to facilitate highway maintenance department use of radio in the Public Safety Radio Service as far as its Rules permit. Any determination or recommendations by the AASHO Radio Committee will receive earnest consideration.



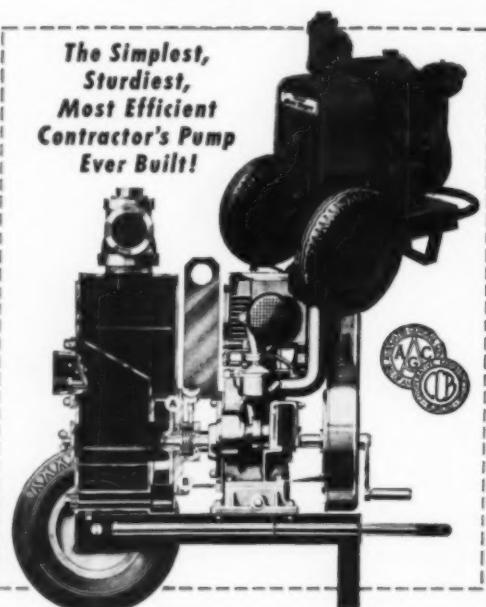
Preferred power on portable power says — the world's most widely used single-cylinder gasoline engines on hundreds of kinds and types of machines, tools, appliances used by industry, construction, railroads, oil-fields, and on equipment for farms and farm homes.

DEVELOPED through years of building the right power for the toughest service, Briggs & Stratton single-cylinder, 4-cycle, air-cooled gasoline engines assure the best in performance, long life, economy. Briggs & Stratton Corporation, Milwaukee 1, Wisconsin, U. S. A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

Worthington's Answer To Your Toughest Pumping Problems...

**The Simplest,
Sturdiest,
Most Efficient
Contractor's Pump
Ever Built!**



Impeller (A) and shaft seal (B)
— the only moving parts

Only two moving parts in a Worthington Blue Brute Self-Priming Centrifugal! And no ports, jets or valves to clog up. Instead, positive self-priming results from expert application of basic hydraulic principles — a Worthington specialty for over 100 years.

Materials are right — in the right places. Impeller and renewable wear plates are of special abrasive-resisting alloy . . . the dual shaft seal is fully enclosed and self-adjusting . . . the steel alloy casing defies rust, erosion and hard knocks . . . the air-cooled engine is easy-starting. So, with all trouble-making gadgets left out, this Blue Brute Portable has absolutely everything you want for fast, dependable pickup, plenty of reserve power — and next to no maintenance!

See your nearby Worthington Distributor for the A. G. C.-rated sizes, base-mounted or with steel or pneumatic-tired wheels.

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WORTHINGTON PUMP AND MACHINERY CORPORATION

Construction Equipment Sales Division

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Distributors In All Principal Cities

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

HI-2

Two Radio Cars Plot Road Sufficiency

The Connecticut state highway department's Records and Statistics Section has completed field work for a Sight-Distance Survey of the 3,000 miles of the state system. The purpose is to establish locations where sight distances are inadequate for today's traffic loads and speeds. It is a part of a program of collecting factual data to be used in planning future highway improvements. The information provided by the survey will be used for a sufficiency-rating study which, in turn, will furnish a basis for establishing improvement-program priorities. The survey data are also used as a basis for setting code markers to establish passing and non-passing zones on the highways.

As described in the departments "Cuts and Fills" publication, sight-distance measurements are based on traffic volumes. On two-lane roads where traffic movements total less than 2,000 vehicles per day, sight measurements of 1500 ft. or less are recorded. On roads which carry 2,000 or more, the measurements are taken in all instances where the sight distance is less than 2600 ft. On four-lane highways sight measurements are recorded only where the sight distance is 800 ft. or less.

How Radio Helps

Two cars equipped with two-direction radios are used to collect the field data. Each car is also equipped with a special odometer on which readings may be taken to one-hundredth of a mile. At every starting point the odometers are synchronized. The lead car has a target in the form of white light attached to its rear bumper upon which the operator of the following car sights. In operation, both cars travel as close as possible to the center line of the road.

With the second car remaining stationary at the starting point, a survey is begun by the lead car which moves ahead until it begins to disappear from the view of the second car either over a hill, around a curve or a combination of both. At this point the following-car operator halts the lead car via radio, and both operators take odometer readings. The sight distance is the difference of the two readings. After the recording has been made the lead car again moves ahead as directed by the rear operator. Readings are taken at 100-ft. intervals in areas of restricted sights. The sight-distance measurements are taken in both directions of travel, the cars completing an entire route in one direction before reversing the procedure.

To provide for the safety of the public and the highway employees while the latter are slowly traveling the center lines, each car is equipped with flashing lights mounted on top of the vehicle. In addition, both cars have warning signs attached to front and rear to warn traffic of the repeated stops which the cars make.

The survey was slowed at times by fog and winter conditions and in warm weather by sun reflection and heat waves. Each survey party was furnished field glasses so that the lead car's target would be visible to rear car at all times. Although absolute continuous synchronization of the odometers was not possible, tolerances were held to a minimum by making adjustments to a common reading every mile. In some instances this adjustment amounted to only one-hundredth in four or five miles.

The field data provided by the survey are plotted in the form of profiles which serve to determine the locations of the passing opportunities and locations of non-passing zones. The profiles are processed by the Division of Traffic Control to establish the zone limits in the field. The limits in the form of code markers set on posts along the highways enable the

operators of the center-line striping machines to adjust their paint sprays for solid or dashed lines as required for straightaways, hills and curves.

Light Peening vs. Yielding of Steel

Howard L. Harrison and Blake D. Mills, Jr. *The Welding Journal*, May, 1951. *Highway Research Abstracts*, June, 1951.

When a steel beam in a bridge or other structure has been bent by an accident, it has sometimes been found practicable to straighten the member in position, instead of replacing it. The straightening procedure has usually been based on the judicious application of localized heat, which causes the metal to expand and yield locally, then upon cooling to contract in such a manner as to accomplish the desired straightening. In some instances, however, it has been found necessary to supplement the heat-and-contraction technique with a certain amount of cold straightening.

For cold straightening of a beam, a heavy transverse force may be applied, utilizing a jack or a cable. If only a steady force is applied, it must produce bending stresses exceeding the yield point of the steel, in order to accomplish permanent straightening. However, if the tension side of the bent member is lightly hammered during application of the steady transverse force, straightening can be effected under a steady force which alone is insufficient to produce yielding. This observed behavior has led to the present laboratory studies of the effect of light hammering on members carrying steady axial tension. The investigation is related also to the peening of welds for the relief of residual stress.

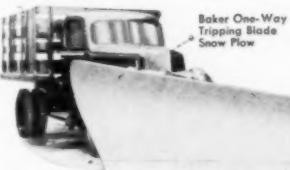
This investigation has been undertaken under the sponsorship of the Engineering Experiment Station of the University of Washington. To date, the work has been only of an exploratory nature, using a simple type of specimen under steady tensile stress. The experimental results are not yet sufficient to warrant any sweeping conclusion. However, the tests indicate the considerable plastic elongation which can result from light transverse hammering on a tension member whose steady stress is well below its yield point.

This exploratory investigation indicates a number of interesting features of the behavior of constant-stress members under light transverse hammering. Even when the steady stress was less than half the yield point, a few hundred light blows of a flat-faced hammer caused quite appreciable plas-

"Dad burn it-
Ole Man Winter
hasn't changed a bit!"



Yes, Sir! Grandpa's stompin' mad! These new fashioned winters have put his old fashioned ones to shame. Weather bureau records prove that 1948, '50 and '51 dumped more snow on grandpa's-in-the-making than grandpa ever knew. He's fit to be tied—particularly when grandson rubs salt in his wounds by saying "wait 'til I tell my grandchildren about the winters we had!"



Note to Street, Highway, Airport Departments: The weather bureau sees no sign that winters will soften up a dad-gummed bit. So, be ready—with Baker Snow Plows—grader, tractor or truck mounted.



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tic elongation. Differences in room temperature and frequency of blows appeared to have a considerable effect. The plastic elongation was confined almost entirely to the zone actually struck by the hammer. The conditions responsible for the plastic elongation have not been established in this investigation. It is possible that the dynamic stresses during each hammer blow were sufficiently high that momentary yielding should be expected, referring to common theories for the yielding of ductile metals, such as maximum shear theory or maximum shear-strain energy theory.

Technical Literature

"SCOUR AROUND BRIDGES," Research report No. 13-B. Consists of a progress report on model studies by Emmett M. Laursen, and a report on investigation of flexible mats to reduce scour around bridge piers by C. J. Posey, D. W. Appel, and E. Chammess, Jr. Sponsored by committee on surface drainage of the Highway Research Board. Address request to 2101 Constitution Avenue, Washington 25, D.C.

"RESISTANCE OF BITUMINOUS MATERIALS TO DETERIORATION CAUSED BY PHYSICAL AND CHEMICAL CHANGES." A bibliography (No. 9) prepared by



Before and After

★ South Main Street, Woodstown, New Jersey, as seen while merchants were tackling a fresh snowfall, and again four hours later, slicing completed

the committee on this subject, of the Highway Research Board. An exhaustive and complete reference of 90 pp. Price 75c per copy. Address Highway Research Board, 2101 Constitution Avenue, Washington 25, D.C.

How Snow Was Cleared from N. J. City Street

The city of Woodstown, New Jersey, has found an effective and economical way to clear its town's main street. When snow stops falling, the streets are plowed to within a few feet of the curb line. At the same time the mer-

chants, who are 100% behind the idea, clean off their sidewalks, leaving a large pile of snow adjacent to the curb. All inlets are diked to prevent escape of water, and then the hydrants are opened. The standing water melts or thoroughly saturates the snow. Then, before the sidewalks were flooded, the catch basins are opened and the whole works allowed to flow away.

Even when the temperature falls far below freezing, snow is removed quickly and efficiently, according to past experience. The accompanying photos show how well the job was done after one storm in a recent winter.

F.O.B. NEXT JOB



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TRAILERS

JAHN TRAILER DIVISION
Pressed Steel Car Company, Inc.
6 North Michigan Avenue, Chicago 2, Illinois

THERE'S A JAHN TRAILER FOR EVERY HAULING NEED



Tandem Axle Trailers



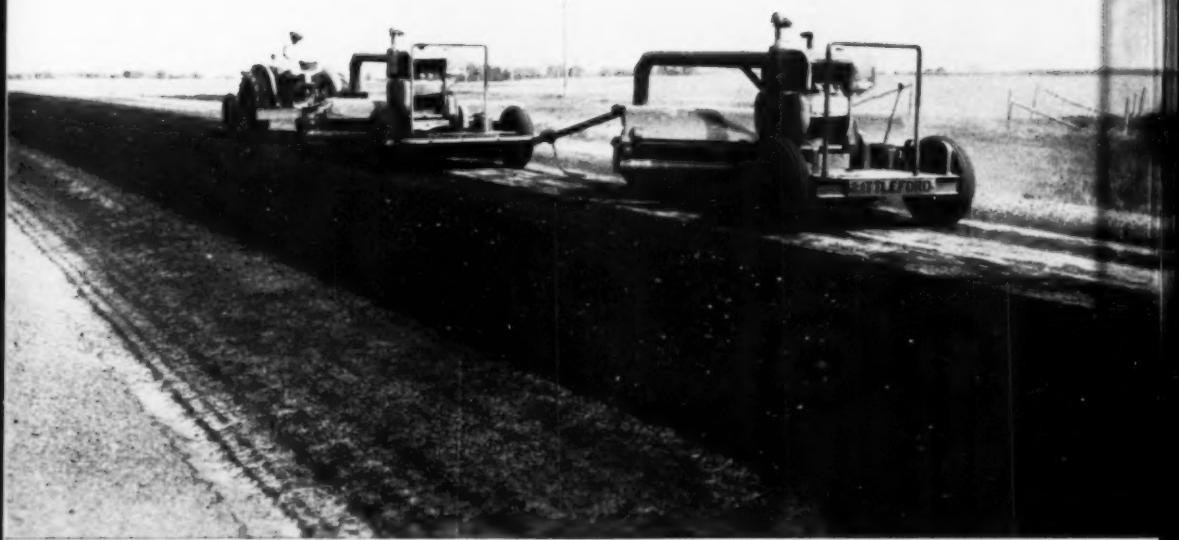
Tandem Axle Tilt Trailers



Single Axle Trailers

Just tilt the trailer bed, load, and you're on your way to the next profitable job. With a Jahn Tilt Trailer, you can move your tractors, rollers, etc. where you want them, when you want to, and with the safety you demand. For moving five tons or a hundred, you can't beat Jahn Trailers.

Bituminous ROADS AND STREETS



Cover Scene

Using two power brooms in tandem to prepare old base for prime or tack coat. Alexander Construction Co., Minneapolis, Minn., contractors, on job at Forest Lake, Minn.

Published by Gillette Publishing Company
22 West Maple Street, Chicago 16, Illinois

Paving 46 Miles of N. J. Turnpike from One Plant Set-up

Contractors Set Fast Pace on Oklahoma Soil Bituminous Jobs

What Makes a Good Seal Coat (or a Poor One)?

Third Article on Bituminous Undersealing Practice

AUGUST, 1951

WHEN you're ready to resurface old roads or build new ones, take advantage of Tarmac's many valuable properties—properties that result in faster job progress . . . in lower labor costs . . . in durable, long-wearing, smooth-riding road surfaces.

Consider, for example, Tarmac's ability to coat the aggregate rapidly and thoroughly, thus reducing mixing time. Plus its ability to penetrate right on through dust or moisture, so

that there's no need for highway crews to remain idle while waiting for the "right" weather. Important, too, is the way Tarmac resists the stripping action of water, without the use and the extra cost of additives.

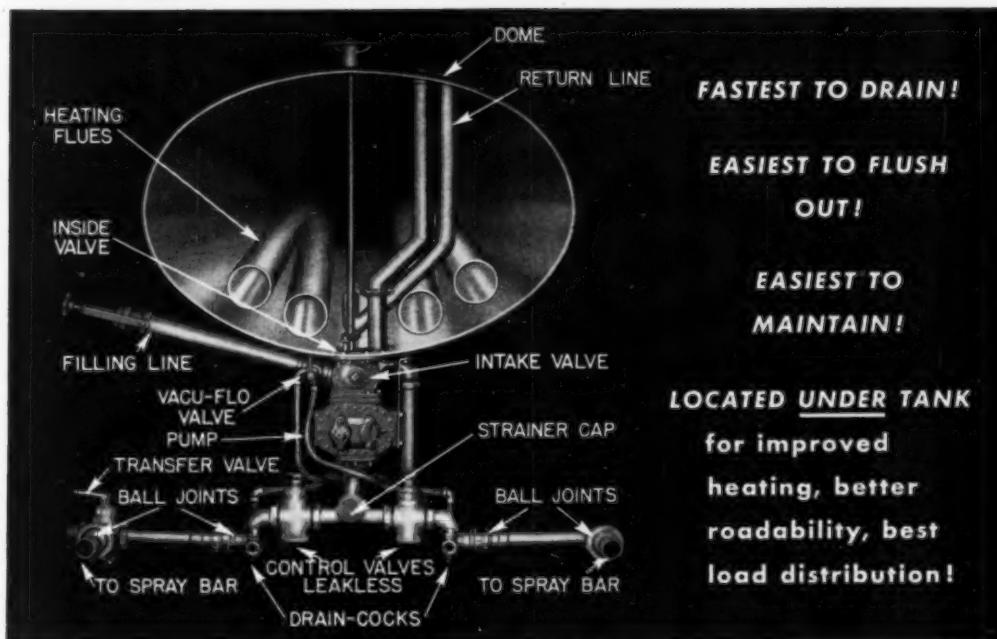
Tarmac Representatives are ready to discuss *your* highway construction and maintenance problems — without charge or obligation. Why not write us, and learn *all* the advantages of using Tarmac?

KOPPERS COMPANY, INC., TAR PRODUCTS DIVISION, DEPT. 832T, PITTSBURGH 19, PA.



Tarmac MAKES BETTER ROADS

Only ETNYRE has this remarkably compact, patented Circulating System



Etnyre's circulating system, designed to take the shortest possible distance from tank to spray bar, brings you savings in weight, savings in parts, and savings in power.

Also, because the circulating system is *under* the tank, it is protected against damage from collisions or other accidents and permits a lower center of gravity for improved roadability, a better design of tank and more efficient heating.

Flanged or union connections are used throughout the system, permitting the replacement of a part with-

out tearing down the entire system. This arrangement also permits the taking up of loose connections without strain on other members.

This unit is easier to clean and can be drained completely. Only material which adheres to walls must be washed out. Just three quarts of flushing oil are needed to wash out pump, spray bar, valves, strainers, and lines. Wall area is smaller due to compact design, thus requiring less flushing oil. In every way, during every day of operation, Etnyre users save material, time, flushing oil, dead weight!

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ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS



MODEL
363

Barber-

PORTABLE CONVEYOR

Complete accessories are available to make the 363 Conveyor adaptable to the widest variety of operating conditions. It is shown here unloading a hopper car with a B-G 358 unloader.



HANDLES ALL MATERIALS: Sand, stone, gravel, wet concrete, chemicals, coal, etc.

UP TO 200 T.P.H. CAPACITY: Available in lengths of 25', 30' and 35', plain or cleated 24" belt.

NO CHAINS, NO SPROCKETS: Power transmitted from gear reducer through shaft to the head-end drive—sturdy, maintenance-free construction.

25 MILES PER HOUR TOWING SPEED: Pneumatic tires, coil springs, shock absorbers, convenient towing hitch.

RUGGED B-G CONSTRUCTION: Designed for maximum strength, minimum weight.

FULL SWIVELING WHEELS: For radial stockpiling as desired.

ALL PURPOSE: Built for contractors, material yards, concrete product plants; aggregate plants, gravel pits, City, County and State Highway Departments, etc.

SEE WHAT ONE MAN CAN DO...



...in one hour, it is the equivalent of 100 truckloads.



...load the truck and move on to the next, double load of trucks on the move.



...load the truck and move on to the next, double load of trucks on the move.

...or, for higher capacity, place the conveyor end in a smaller truck and...



...load the truck and move on to the next, double load of trucks on the move.



...load the truck and move on to the next, double load of trucks on the move.



For Those Smaller Jobs—the B-G 362

Here is the ideal medium-duty Portable with capacities ranging to 100 tons per hour. Designed to handle all materials, fully portable, the B-G 362 Conveyor is low in cost, yet has the usefulness in its capacity range of the heavier duty 363. Featuring B-G latest design with shaft drive, dust-sealed foot end, rugged B-G frame, etc., the 362 will give years of dependable low-cost service.

see your B-G distributor

Greene

MODEL
358

ALL MATERIAL CAR UNLOADER



FAST: Unloads hopper cars in 45 minutes!

VERSATILE: Unloads all types of bulk materials—gravel, sand, stone, coal, cinders, slag, ores, etc.

HIGH CAPACITY: Ranging up to 170 t.p.h. for material weighing 100 lbs. per cu. ft.

POSITIVE, NON-SLIP: Chain and belt are bolted together at cleats. Starts without slippage under full load.

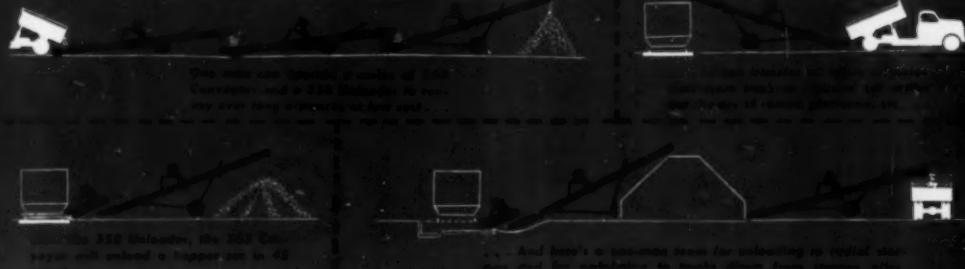
PORTRABLE: Shock absorbers, towing hitch, perfect balance allow 25 miles per hour road speed.

ONE-MAN OPERATION: Releases expensive crane clamshells, etc., for more productive work.

CHOICE OF POWER: Gasoline or electric with V-belt drive to speed reducer.

547350

SEE HOW YOU CAN SAVE...



send for bulletins

These suggestions are only a few among many proved ways that modern, portable Barber-Greene Conveyors and Unloaders can help you combat high costs and the manpower shortage. For full information, write to the address below, or ask your Barber-Greene distributor.

High capacity combined with low-cost operation identifies the 358 Unloader. Economical enough for intermittent work, amply rugged for those continuous high-production operations.



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Barber-Greene Company

AURORA, ILLINOIS, U. S. A.

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3 Types of Paving Built Better

with *Bitumuls*



1

MAINE—

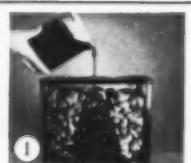
Highway Department engineers have placed over two million sq. yds. of BITUMULS macadam — a standard type of pavement since 1931. They know how thoroughly it penetrates interlocked stone.



2

OREGON—

Engineers observe the ease with which BITUMULS mixes with damp native aggregates — and gives early pavement stability. Above is a road near Mount Hood, where crushed aggregate is not readily available.



1
It PENETRATES



2
It COATS DAMP NATIVE MATERIALS



3
It SEALS



3

HONOLULU—

In most highway paving manuals, BITUMULS is a recognized standard for sealing and surface treating. Engineers in Honolulu are no exception—they "shoot" BITUMULS the year 'round.

Our regional engineers can help you.

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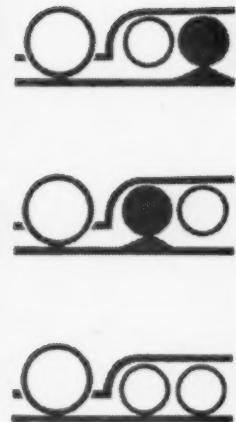
In the West

STANCAI ASPHALT & BITUMULS COMPANY

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What is 3-AXLE SMOOTHNESS?

The answer to this question is a matter of record. By actual test, it is the highest degree of road surface smoothness ever attained with tandem roller. A leading state highway department proved that the Buffalo-Springfield 3-axle tandem produces surfaces 50% smoother than the average obtained with conventional tandems of equal capacity. Also noteworthy, the same test showed that the 3-axle tandem averaged 60% more tonnage compacted than other units on the project. As a result, the specifications for asphaltic surfaces in this state now permit the use of one less tandem roller with each spreader, *provided a 3-axle tandem is one of the rollers employed.*

Still another state specifically requires the use of a 3-axle tandem on certain plant mix surfaces.

There's a reason for this greater work capacity and smoother rolling results. The two large diameter guide rolls and the drive roll of the 3-axle tandem are rigidly mounted in a position tangent to the same plane. Thus, when one guide roll strikes a high spot in the pavement, the other is lifted clear of the surface and its weight transferred to the rolls retaining surface contact. Result—maximum compactive effort where it is needed most—on the high spots in the surface.

You can learn more about this transfer-of-weight principle and the many other exclusive features of the Buffalo-Springfield Model KX-25, 12 to 19 ton, 3-axle tandem from your nearest distributor. Why not call him today?



THE BUFFALO-SPRINGFIELD ROLLER CO.
Dept. S-B, Springfield, Ohio

Please send me Catalogue S-56-49 describing the right model for my requirements.

Notify Distributor to call.

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IT TAKES A LOT OF ANSWERS TO BUILD A BETTER ROAD

*How absorptive will
compacted subgrade be?*

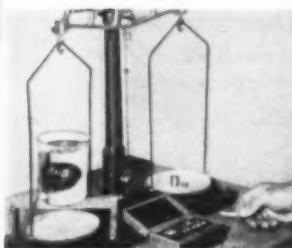
*Will local aggregate make a
satisfactory base course?*

*How thick should base
and wearing course be?*

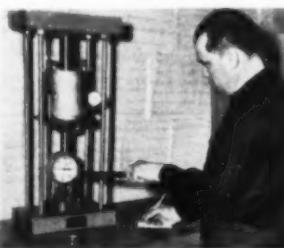
*How will paving stand
up to spring thaws?*

**And Ohio Oil's top engineering staff is always ready
to find them for you in its modern laboratory**

Plenty of engineering problems have to be answered before any road project can be started. To find those answers takes plenty of engineering skill, practical experience, and complete, specialized laboratory equipment. Ohio Oil has them. We'll gladly put them to work for you—without cost or obligation.



Specific gravity and voids-ratio analysis determines whether local aggregate will make a proper asphaltic mix.



Hubbard-Fields Stability Machine finds the shear strength of a compacted mix.



Viscosity machines test how well a particular type and grade of asphalt will flow under local conditions.

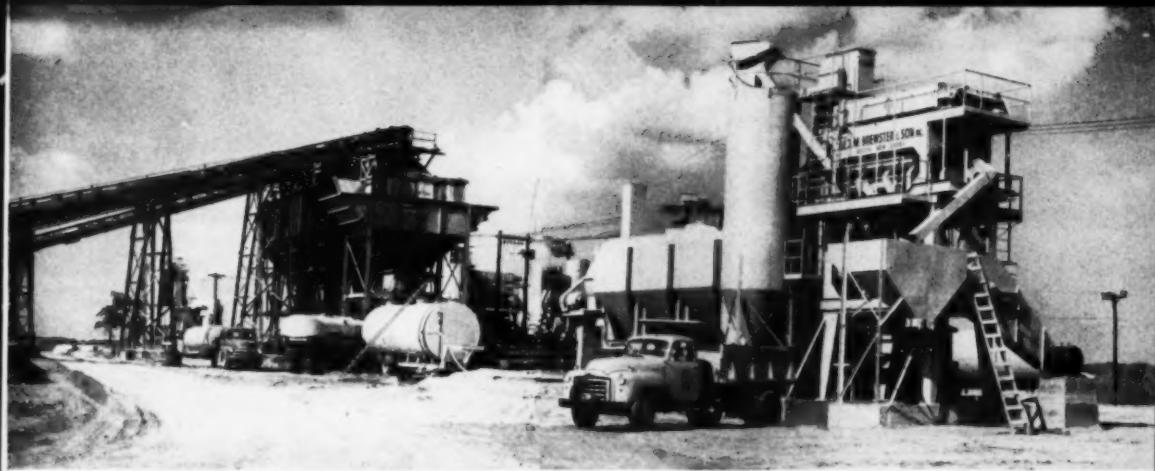


This 15-state area is served
by Ohio Oil—a major source
of asphalt for 26 years



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★ Plant set-up as seen from rear corner. Asphalt plant No. 1 in foreground. Cold stock bins in distance. Also seen is one of four 10,000-gal. mobile asphalt tanks and transport trailer tank set on blocks as a fuel storage unit

Paving 46 Miles of Turnpike from a

Single Plant Set-up

How New Jersey Turnpike Sections 3 and 4 are being supplied with 375,000 tons of hot mixed asphaltic concrete this season, working from a 4-plant unit centrally located along the job

AMONG the paving operations on the New Jersey Turnpike this year much interest centers in the one to be seen at Cranbury Station, north of Trenton. Here paving sections No. 3 and 4 (Contracts No. 61 and 62) totaling 46 miles of line are being supplied from a single plant location. Geo. M. Brewster & Son, of Bogota, N.J., general contractor for the two adjoining sections, installed the plant. Tioga Construction Co. of Lancaster, Pa., is operating the plant and placing the asphaltic concrete pavement. The Tioga hot-mix placement schedule is being synchronized with Brewster's many second-year activities, which include bridges, grading clean-up, gravel sub-base, and penetration base construction. The Tioga crew is placing only the three 1½-in. layers of asphaltic concrete.

The paving schedule calls for placement of the entire 375,000 tons of mix by late October, which means an average of 25,000 tons a week, rain or shine. Production started in July.

Plant Layout

The plant is built around four Mad-

sen 2 ton batch plant units, served from a single stockpile and bin set-up. All aggregates are trucked in. Aggregates are dozed into apron feeders, thence traveling via Barber-Greene 192' x 30" belts to large-capacity cold stock bins (1500 tons combined), one for each of the four aggregate sizes. Each bin feeds via four chutes to Syn-

tron vibrating feeders, positioned and calibrated to feed aggregates to any or all four horizontal distributing belts. From the belts the material is taken by elevator to the driers and through the respective plants. Thus any one or all four asphalt plants can operate independently of each other, as output schedules require.

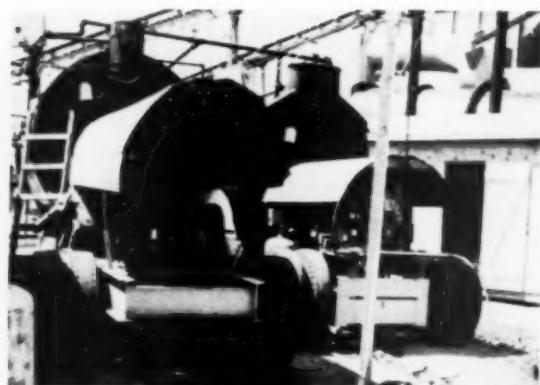
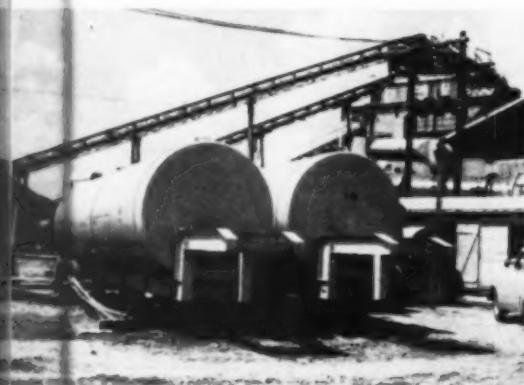
The Madsen plants are of conventional design, except for the new (in the east) feature of electric-automatic controls of weigh batching operations. Hardy controls are used, similar controls being required on all asphalt plants serving the various Turnpike contract sections.



★ "Trailerville," Trailers house respectively (1) Mr. McMinn, president of Tioga Construction Co., and office assistant; (2) Contractor's supervisory office, with drafting table, radio, blueprints, records; (3) Testing and inspection control headquarters; (4) Field office of the Section Engineers.



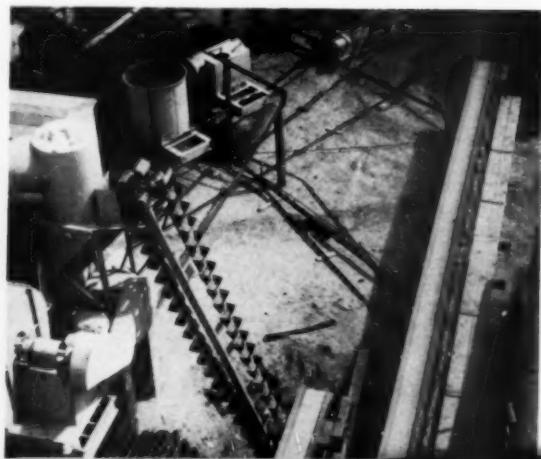
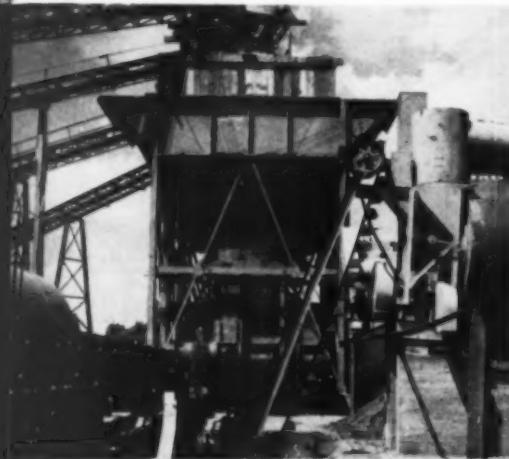
★ Plants 2 and 3, seen from the front. Turnpike located off to right

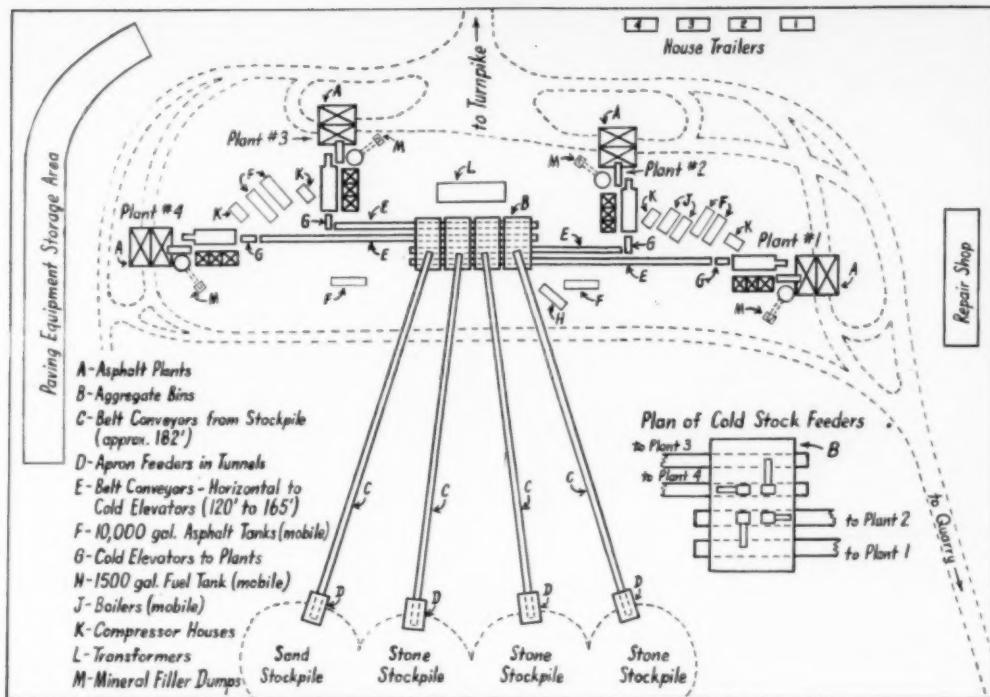


★ Two more 10,000 gal. asphalt tanks, mounted on low-bed trailer frames as mobile units. (Right); also wheel-mounted are these steam plants for heating asphalt. Equipped with Ray automatic oil burners.

64

★ (Left) Horizontal belts leading to two plants are shown here, the one spilling in foreground being for plant No. 2. (Right): Another view of the same two belts, showing their arrangement in relation to the plants.





★ Plan sketch [to approx. scale] showing how the four asphalt plants are served from a single aggregate supply system

Belts, elevators, driers, pugmills and other mechanical units are electrically powered throughout, from current supplied by a 33,000-v. utility highline through transformers to 440 v. electric motors (Westinghouse and others) varying from 1 to 125 hp. Pugmill motors are 125-hp., drier motors 50-hp., blowers 35 hp., down to 1-hp. on the dust feeds.

Since mineral filler is a specified ingredient, a dumping hopper and Corrigan underground screw feed for supplying filler into a 150 bbl. silo are located alongside each plant. The filler is added to the material reclaimed by Cyclone dust collector on each plant. For other details of this plant system, see the accompanying table and sketch.

Mobile Accessories

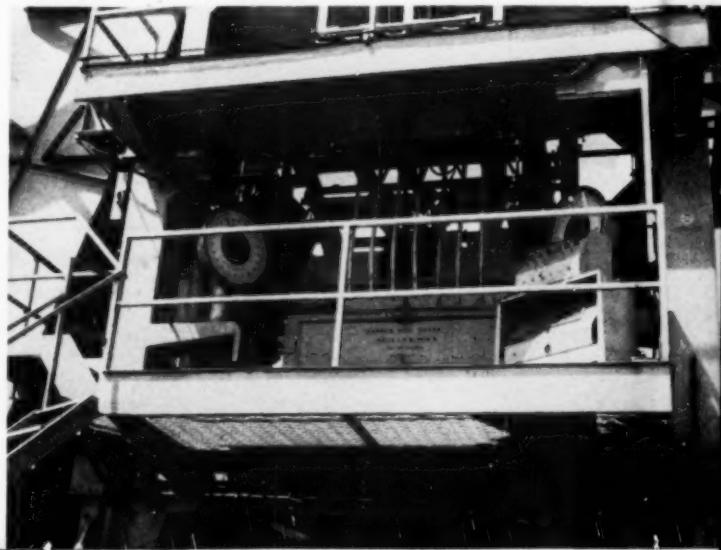
An interesting feature is the use of mobile storage and accessory equipment, furnished by the Tioga Construction Co. Four 10,000 gal. asphalt tanks are each mounted on low-bed trailer frames, ready to move simply by putting on the wheels and backing up with the truck tractor. A fuel tank, spotted centrally in the rear for supplying all dryer burners and steam coils, consists of an old transport semi-trailer; its back end is used as a tool

house for the plant maintenance men.

Tioga's asphalt heaters consist of two 100-hp. 125-psi. boilers with 3-in. steam coils. These outfits, too, are chassis-mounted, ready to roll. All steam lines are jacketed and fitted with a steam condensation return system.

Two pumping systems are able to receive asphalt around the clock from the incoming transport trucks. The four asphalt plants are hooked up in pairs of two each, there being one asphalt pump and one fuel pump for each group. A top schedule of 50,000 gal. daily of 85-100 penetration as-

★ The automatic control panel and scales shown here are required in an effort to secure greater uniformity of mix





LAUSON
ENGINES
ARE BUILT TO *last*!

Extra attention is given to the materials and engineering that go into every Lauson engine — refinements such as automotive-type pistons, simultaneous cooling of both valves, safe, sure fly-ball governors, and selected long-life bearings . . . refinements that add up to . . . smoother running, trouble-free operation, and more hours of power! The most surprising feature of all is that Lauson engines cost no more than ordinary engines!

**THE *oldest* NAME IN
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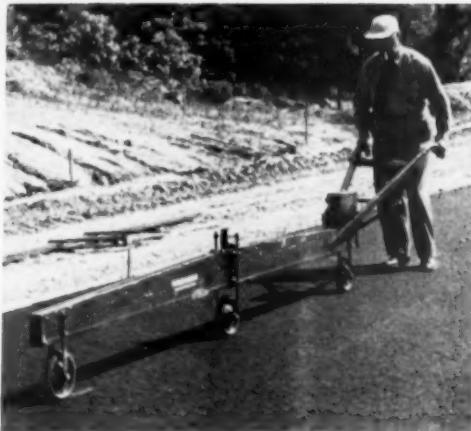
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★ Kelley & Meyer's surface tester, used on the N.J. Turnpike

**Asphaltic Concrete Being Placed in
Three Layers on N.J. Turnpike**

The design of the hot mixed asphaltic concrete pavement for the New Jersey Turnpike has been changed from two layers to three, keeping the same total thickness of 4½ in. Side forms, originally specified in connection with the placement of a 2 in. and a 2½-in. layer, are also eliminated in the paving work, now in full swing.

In lieu of side forms the contractors are being required to place the first 1½-in. course 24' 8" wide or to an extra width of 4 in. on either side; the second course 2 in. extra width on each side, and the top course neat or 24' 0" wide.

In addition to meeting the objection of contractors to the use of side forms, the method adopted gives the engineers and the contractors three chances, instead of two, to meet the smoothness tolerance of 1/16 in. in 16 ft. specified for the surface course.

It is reported that subbase and base densities as well as the smoothness tolerances of all lifts are causing no particular trouble on the Turnpike work. Some of the contractors are routing their material trucks and other equipment systematically over the base, subbase and base courses, thus greatly aiding the rollers in securing densities.

Pictured here is a device used with good results by Kelley & Meyer, of Youngstown, Ohio, subcontractor for Savin Construction Corp. on Section 2. This bump tester is 10 ft. long. It is equipped with a battery-charged buzzer, which sounds whenever the middle wheel drops or rises perceptibly, whereupon the operator marks the uneven spot with chalk. The device is worked with and in cooperation of the roller man. A steel rod rising from the middle wheel axle is equipped with a cross bar which floats between two bolt heads. As uneven areas are reached, the cross bar is raised or lowered, making electrical contact.

phalt is expected to be received to keep the plant going 12 hours per day. Asphalt is supplied from Standard Oil Co. of N.J.

Joint Supervision

The plant, in supplying two contract sections of the Turnpike, also comes under the jurisdiction of two Section Engineers. Contract 61 is under Parsons, Brinckerhoff,

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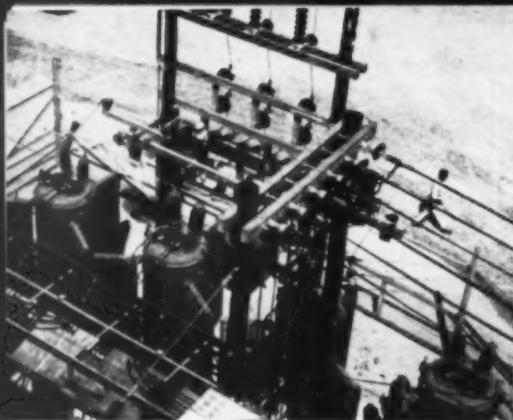
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★ Transformers for reducing 33,000 v. to 440 v. for motor drives. [Right]: One of the four Barber-Greene 192-ft. belts.



Laboratory Testing Schedule for Paving New Jersey Turnpike Sections 3 and 4

Material	By Contractor	By Commercial Testing Lab.	By Section Engineers
Sub-Base Type "D"		Initial & periodic samples	Every 350 T. (Not less than every $\frac{1}{2}$ hr.)
Macadam Base Course Aggregate			Every 200 T. Thins & flats: every 8 hrs. Every 50 T.
Screenings Asphaltic Concrete Coarse Aggregate		Initial & periodic samples	Cold bin: Every 50 T. (Not less than every $\frac{1}{2}$ hr.) Hot bin: every 4 hrs. Thins & flats: every 8 hrs.
Fine aggregate	Hot bin: every hr.	Initial & periodic samples	Cold bin: every 50 T. (Not less than every $\frac{1}{2}$ hr.)
Mineral filler			Cold bin: every 50 T.
Asphalt		Full tests at source, reports to engineer	Penetration each day plus each car or truck
Plant mix			Two samples/shift/plant: 16# for $\frac{3}{4}$ " max. 20# for 1" max.
Test cores: 4" diam.	Taken under supervision of engr.	2 out of every 10	Every day and/or at least every 4000 sq. yds. 6 out of every 10: thickness & density stability if possible 2 out of very 10: retained & preserved
10" x 10" for $\frac{3}{4}$ " max.	Taken under supervision of engr. after each shift	As directed by special bituminous consultant	Tested for density & extracted (cored for stability if above samples are unsatisfactory)
Type "G" Shoulder Gravel			Every 250 T. Grad. daily: for max. of 5% shale, slate, schist & soft or decomposed pebbles
Broken stone		Initial & periodic samples	Every 200 T.: gradation
Sand Cover		Initial & periodic samples	Every 50 T.: gradation
Cover aggregate		Initial & periodic samples	Every 50 T.

Hall & Macdonald; S. A. Trevarthen, chief resident engineer. Contract 62 is under DeLeuw, Cather & Co.; R. B. Richards, project manager, and Quigley Fletcher, project engineer.

As a means of unifying the plant control the two Section Engineers jointly engaged the services of H. W. Gilliard of Pittsburgh Testing Laboratories as Special Bituminous Consultant, with W. C. Bliss as plant resident engineer. Each Section Engineer is furnishing one-half of the inspection staff totaling 12 men.

As might be expected for such a large and exacting job the plant inspection and control procedure is somewhat more detailed than usual. There is an inspector on each of four plant units. Plant control is directed from an office trailer, and routine tests and inspection duties are performed from a spacious field laboratory building. The accompanying table shows the details of the routine.

The specifications for the Turnpike [April R and S] call for blending four aggregates—sand, stone screenings, $\frac{3}{4}$ in. and $\frac{1}{2}$ in. stone. After passing through the drier the blended material is screened into four sizes and stored in four hot bins. These sizes are for material passing the No. 6, 5/16 in., $\frac{3}{8}$ in., and 1 in. screens. The material is then re-combined in such a manner that the final mix will meet specified tolerance limits for various gradation brackets, the closest tolerance being plus-or-minus 0.2% for the asphalt content of the mix sample in relation to the design mix.

Tioga's Paving Outfit

The Tioga Construction Co. was equipped to begin hot mix placement and related work at two simultaneous locations with the following equipment:

BITUMINOUS ROADS AND STREETS

Details of the Brewster-Tioga Asphalt Plant New Jersey Turnpike Sections 3 and 4

Cold Stock

No. of bins	4 (one 300 t. Blaw-Knox; three 400 ton unnamed)
Types of bins	bottom feed
Capacity	1500 tons combined
Type of feed, bins to driers	Sytron vibrating feed, Barber-Greene belt conveyor, bucket elevator

Drying Units (per plant)

No. of units	1
Size	84" x 21"
Type of drive	chain
Speed and pitch	7.5 rpm, .6%
Type of burners	Hopkins-C. P. Volcanic
No. of burners	4
Type of fuel	No. 6
Type of temperature control	Pyrometer at drier discharge

Hot Bin Storage and Screens (per plant)

Type and size hot-stock elevators	bucket elevator 7" x 16"
Type screens	Symons
No. of screens	4
Pitch of screens	flat-vibrating
Size of screens	48" x 12'0"
No. of bins	4
Capacity of bins	12 tons
Type of discharge	roller mounted, air operated gates

Weigh Box and Aggregate Scales

Capacity of weigh box	4400 lb.
Type of discharge	air operated
Type of scales	dial
Capacity	5000 lb.
Sensitivity	10 lb.

Asphalt Scales and Bucket

Type of scales	Yale, dial type
Capacity	500 lb.
Sensitivity	2 lb.
Type and size bucket	non-tilting 40" x 20"
Capacity	400 lb.
Type of discharge	pressure injector
Type of temp. control	thermometer at bucket

Dust Collector and Mineral Supply

Dust collector	3-unit Cyclone, feeds to silo
Filter supply	J.C. Corrigan hopper and screen feeder to silo
Filler bin	150 bbl.
Type	Twin-shaft
Size	4000-lb.
Blades	14 on a shaft
Controls	Hardy electric automatic

Material Storage and Delivery

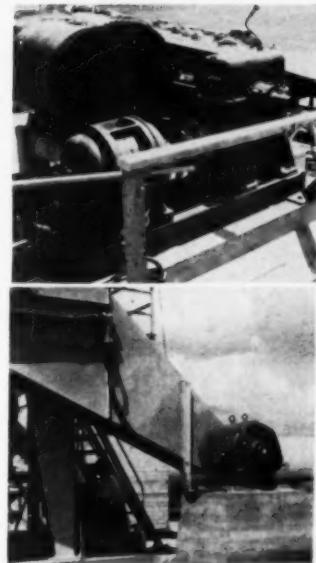
20,000 ton (plus) stockpiles, 182 ft. Barber-Greene Conveyors

Asphalt Storage

Four 10,000 gal. mobile tanks, two mobile stream coil boiler units; 24 coils per tank, 3-in. coils, suction pump.

2 Littleford power brooms	(2500 gal.)
2 heater carts	1 1,000-gal. distributor
5 Barber-Greene finishers	3 sprinkler tanks (500 gal.) mounted on
4 Galion 3-wheel rollers, 10 t.	GMC and International trucks
1 Buffalo-Springfield 3-wheel roller, 10 t.	1 tool trailer
4 Galion tandem rollers, 10 t.	1 2½-ton dump truck (GMC)
2 Buffalo-Springfield 3-axle bump rollers	1 grease truck, flat bed (GMC)
2 Buffalo-Springfield tandem rollers, 8 t.	1 Littleford fuel semi-trailer tank (3500
2 pressure sprinkler semi-trailers (1,000 gal.)	gal.)
1 Autocar with semi-trailer water tank	The details of asphaltic concrete

★ Asphalt and fuel pumping is hooked up to supply the four plants in pairs. Jacketed steam lines, equipped for reclaiming with condenser return. (Right): State scale inspector calibrating the weigh box for one of the Madsen Plants



★ (Upper): Gear reduction motors were used to power the stockpile belts. (Lower): Note enclosed V-belt drive for pugmill

placement on this and other Turnpike contract sections will be treated in a future issue of *ROADS & STREETS*.

The Tioga Construction Company's work is directed by J. F. McGarry, vice president and project manager, with W. C. McMinn, president, taking an active hand in the job. George Atkinson is plant superintendent, and Ward Hildebrand and J. Marshall, paving superintendents.

Pennsylvania Crew Does Quick Bridge Repair Job

When a log protruding from a truck struck the center vertical of the 560-ft. multiple span bridge which





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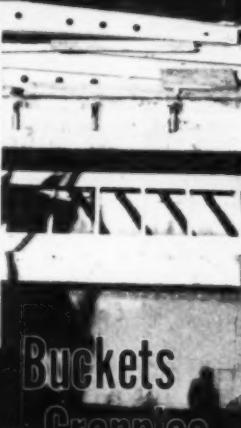
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carries TR 62 across the Allegheny River at Tionesta, Pennsylvania, state highway department engineers quickly moved in to inspect the damage.

They found the vertical was twisted and buckled in the center of a span, and as a result the bottom cord buckled and the top cord sagged. Truck and bus traffic had to be halted although passenger cars were permitted to pass. This was at 4 p.m.

At 5 p.m. highway maintenance forces started to assemble material on the job. At 6 p.m. the operation of replacing the vertical was started. It was a particularly difficult operation since it was necessary to support the span during removal of the old vertical and replacement of the new.

Jobs like this normally require many days to complete.

But by working through the night and the following day the crew completed the task and restored the bridge to trucks and buses at 10 p.m.—a total of 29 hours.

Glenn D. Myers, District Engineer for the department, says this is a new record in bridge repairs.

Seven States Increase Gas Tax Rate

Gasoline tax increases have been voted in seven states recently. Two states have a decrease in effect. A survey by the National Highway Users Conference reports that Michigan's tax is up 1 1/2¢ to 4 1/2¢ [see R&S July]. One cent increase is in effect in South Dakota, Utah, New Hampshire, North Dakota and Wyoming, in all cases the present rate now being 5¢.

The New Hampshire increase will be used to retire a \$15 million highway bond issue. The North Dakota increase will go for state and secondary highway purposes. The South Dakota and Utah increases will swell the present fuel tax proceeds. The Wyoming increase will go 75% for county farm-to-market roads and 25% for city and town streets.

Both Georgia and New Mexico have cut their taxes back from 7¢ to 6¢.

Diesel fuel taxes are up in several states—Michigan (5¢ to 6¢); Nevada (5¢ to 5 1/2¢), New York (4¢ to 6¢); also in all states where gasoline taxes were raised, the diesel tax was also raised except in the case of Wyoming.

The proposed increases were defeated this year in Arkansas, Colorado, Indiana, Montana, Nebraska, New Jersey, North Carolina, Oklahoma, Texas, Vermont, Washington and West Virginia. At this writing a bill to add 2¢ is pending in Missouri.

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★ Broce Construction Company crew at pit, loading imported sandy-loam for asphalt stabilization. Dozer, trap and loader belt feed to a special large-capacity bottom-dump over-the-road type hauling trailer. Note dual wheels, and also striped safety or warning panels mounted back of rear wheels.

Contractors Set Fast Pace on Oklahoma

Soil-Asphalt Jobs

SOIL-BITUMINOUS stabilization methods have reached a relatively high stage of development in Okla-

homa, where a large mileage of this type of construction has been completed in the post-war years (see



★ Ray Broce with his P & H stabilizer, on Beaver County project. Harry Coleman, operator

ROADS & STREETS, June, 1950). The 1950 season saw several unusually rapid and large scale contractor operations in soil-bituminous work. Two examples are pictured and briefly outlined herewith.

1. One noteworthy project was No. SAP-826 (16) Pt 1, which consisted of 7.77 miles of 8" x 24' soil-asphalt base using MC-3 cut-back asphalt at 4% to 5% by dry weight with imported sandy-loam soil. The job is located in Beaver County, Oklahoma, on state highway 3 and US 270.

Broce Construction Company, of Woodward, Okla., was awarded this job in the April 4, 1950, letting, which letting incidentally, included 101 miles of soil-asphalt work. This contractor used a P & H stabilizer, necessary



★ Broce's processing train at work in Beaver County. The lead tank truck is one of four hauling units kept busy on average daily delivery of 60 to 70 thousand gallons of cut-back materials.



★ Asphalt job storage facilities established by Park-Ward Construction Co. for Major County job. Six 12,000-gal. tanks this contractor's usual job capacity. The 4,500-gal. tank truck at left brought material from the refinery to job storage. The 1,200-gal. haul truck on right is being loaded by a Cleaver-Brooks heater-booster for supply to the stabilizer

tank trucks for asphalt and processing water, and rollers. A production rate of 1400 sq. yd. per hour was maintained, using the outfit pictured here. Best day's run for the 1950 season was 1½ miles of road base, or 21,146 sq. yd., which required 82,000 gal. of asphalt delivery in 14 hours' working time. Some 60,000 to 70,000 gal. of asphalt per mile was required on the average.

This contractor completed 64 miles of such work in several Oklahoma projects during 1950, finishing up 25 miles in the month of September alone. This work was performed by one new stabilizer machine, Another P & H unit owned by Broce was employed on smaller projects in Kansas.

Surfacing for the projects consisted of a single course of inverted penetration employing 0.3 to 0.5 gal. per sq. yd. of asphalt cement with crushed limestone graded from ½ in. down to 0%-5% passing the No. 10 screen, applied at the rate of 1 cu. yd. to 80 sq. yd. of surface.

2. Another project pictured is SAP-684 (1) in Major County, comprising



★ On the Park-Ward job in Major County, compaction of processed base material was accomplished in thin layers by passes of this contractor-built "Mogul" roller

3.92 miles of road on state highway 15. The processing consisted of 8" x 24" of soil-asphalt base using MC-3 in proportions varying from 4.5% to 6.0% by dry weight with imported sandy-loam soil. The surface finish also was identical with that of the afore-mentioned project.

Park-Ward Construction Company,

of Oklahoma City, took the job on April 4, as one of several projects under which the firm completed 64.5 miles during the season. Also using a P & H machine, this contractor reached a production peak of 6,950 lin. ft. of base, or 18,556 sq. yd., in a single 12½-hour day, using 83,830 gal. of asphalt that day.



★ Park-Ward's processing train. Asphalt being pumped into stabilizer tank truck and another supply truck waiting. Processed material being rolled by rubber-tired unit to put it in shape for contractor's traffic and to shed rain until the lay-down and finishing crew moves in to complete the base work.

What Makes a Good Seal Coat Job?

The above question is answered in reverse by a terse report, issued by the Highway Research Board committee on thin bituminous surface treatments with aggregate cover. Chairman of this committee is Bailey Tremper, materials and research engineer, Washington department of highways.

Entitled "Factors Adversely Affecting the Performance of Thin Bituminous Treatments with Aggregate Cover," this report was prepared in the belief that spotlighting such factors

would be a useful starting point in a study of ways to avoid or minimize unsatisfactory results. The report was presented at the Board's recent annual meeting in Washington.

A list of adverse factors is given below as a matter of general information.

A. Poor initial adhesion of aggregate or non-uniform texture.

1. Insufficient film of bitumen for the size and shape of aggregate employed. This may result from (a) designating too low a rate of application of bitumen or (b) excessive absorption of bitumen by the surface being treated.

2. Too great a range between maximum and minimum size of aggregate particularly when an excess of undersize material is present. Medium curing asphalts will tolerate a greater proportion of undersize aggregate.

3. "Dirty" aggregate.

4. Aggregates that resist coating with bitumen.

5. Aggregates that are too dry or too wet. If too dry, adherence by emulsions may be hindered or traces of dust may resist penetration of all types and grades of bitumen to the aggregate particle proper. If too wet, initial adhesion of the bitumen is delayed until surface water has evaporated.

6. Initial viscosity of bitumen too low with consequent tendency to flow down grade or from the center to sides of the roadway.

7. Slow setting rate of cutbacks or emulsions.

8. Wrong grade of bitumen for grading and character of aggregate or for prevailing weather conditions.

9. Unfavorable weather conditions.

B. Poor non-skid qualities of treatment.

1. Application rate of bitumen too high.

2. Excessive flatness of aggregate not given sufficient consideration in determining application rate of bitumen.

3. Use of aggregates that tend to polish excessively under traffic.

4. The factors listed below under "C."

C. Poor service life.

1. Aggregate too friable resulting in degradation under traffic with broken fragments filling voids, causing bitumen to flush to surface.

2. Excessive hardening of bitumen and loss of ability to adhere to aggregate.

3. Poor weather resistance of aggregate.

4. Poor resistance of aggregate-bitumen combination to stripping in the presence of water.

D. Poor construction practices.

1. Improper preparations of surface to be treated.

2. Non-uniform application of bitumen, including excessive overlapping along center and transverse joints.

3. Non-uniform application of aggregate.

4. Bitumen too cold when aggregate applied, due either to an application temperature that is too low or to spreading too far in advance to permit prompt cover with aggregate.

5. Segregation of aggregate into

(Continued on page 77)



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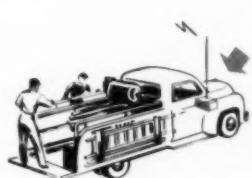


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★ The D-H Paving Company's undersealing crew, placing hot asphalt materials under a pavement on Highway 1, Riverton Hill to Seattle city limits.

Bituminous Undersealing Practice

Third in a series of articles summarizing recent state highway department pavement undersealing programs, with special respect to contractor participation. See May and June, 1951, issue of *Roads and Streets* for the first two articles.

Washington State—During the fiscal year 1950-51 the State Department of Highways awarded two contracts for resurfacing old pavement with asphaltic concrete, in which the drilling of the pavement and sub-sealing were included as items of the contracts. Prior to that time all such drilling and sub-sealing had been accomplished as construction with state maintenance forces, according to R. P. Newland, State Maintenance Engineer.

Both contracts were on Primary State Highway No. 1 (U.S. 99). One contract extended for 2,748 miles, Riverton Hill to Seattle city limits, and was let to D-H Paving Co. of Vancouver. This is on a four-lane section.

This firm drilled 2178 holes and pumped 80,055 gal. of hot asphalt.

The other contract, let to C. V. Wilder & Co., of Bellingham, extended for 1,644 miles of city street on P.S.H. No. 1 in Bellingham. The contractor drilled 1075 holes and pumped 8461 gal. of hot asphalt.

[Editor's Note: A third contracting firm in this state which has had considerable experience in such work is Columbia Asphalt Paving Co., 219 Masonic Temple Bldg., Yakima, Washington. It is understood that they have completed an extensive project of undersealing the runways on Fairchild Field, an Army Air Base near Spokane.]

West Virginia—This state undersealed a concrete pavement in 1950 in connection with a contract job, according to B. D. Johnson, Regional Construction Engineer, State Road Commission, who gave the following data:

The project was about 4.5 miles long, through South Charleston, some of it being 4-lane width but most 6-lane with raised median and curbs both sides. It was divided about equally into two contracts and involved resurfacing with about 225-lb. of hot mix leveling course and an 80-lb. natural rock asphalt wearing course.

Some of the concrete pavement was war-time construction (about 1943) and without reinforcing mesh or load transfer dowels. Joints were spaced 20 ft. with an expansion joint every 120 ft.

A few of the joints showed some evidence of pumping and it was thought advisable to set up undersealing as well as cleaning and resealing of all joints and cracks. A tar pitch was used for the undersealing and a rubber-asphalt compound for the joint sealing.

A portable heating tank equipped with hand-operated pump and a 3-way valve and return circuit hose were used, as shown in the accompanying photographs taken by Mr. Johnson on the first day this work was started.

The total quantities used for subsealing on the project were about 3100 gal. of tar at an average bid price of \$0.65 and 415 holes drilled at a bid price of \$0.90. The cleaning and sealing of cracks and joints totaled 196,400 lin. ft. at a bid price of \$0.15.



★ Another way of mounting drilling equipment for making pavement holes. D-H Paving Co., near Seattle.

The puzzled look on the faces in the pictures was due to the fact that the pump on first heating tank did not develop sufficient pressure and after a considerable amount of cranking, nothing came out of the valve. A more efficient tank and pump was substituted and no further difficulty was encountered.

This was the first of two projects where this type of work was contracted. The second one, being carried out this year, involves the use of 10,000 gal. of tar at a bid price of \$0.40 and the drilling of 500 holes at \$0.20, all included in a contract for widening and resurfacing.

Some work of this nature has also been done in the last two or three years by state maintenance forces in advance of resurfacing with asphaltic concrete, but no cost figures are available.

Connecticut—The old way of drilling mud-jack holes has been abandoned in favor of much more efficient methods, according to a statement from the highway department of this state. A drill-rig where a man may sit while operating his drill has replaced the old, dangerous job where the driller, holding the jackhammer while drilling, had to start the bit by guiding it with his feet.

The new outfit employs a tractor upon which the drill-rig is attached at the rear as shown in the accompanying photo.

With this arrangement the workman operates the drill from a sitting position in comparative safety. The drill can be raised or lowered on the column and can be swung at any angle to the horizontal.

When the jack-hammers were operated by men in a standing position, from 3 to 8 minutes were required to drill a hole through 8 in. concrete



★ A novel rig devised in Connecticut—consists of a LeRoi Tractair, equipped with a "Trac-Jac" unit for drilling mudjacking holes. Photo 1950

pavement. With the new rig the time required is only 1 to 1½ minute per hole. In addition, the drill operators experience much less fatigue than formerly. Two of the rigs are now in service.

[This unit while developed for mud-jacking, would seem to be worthy of adapting in other states for hot undersealing work. Editor.]

Texas: P. S. Bailey, Maintenance Engineer, Texas Highway Department: Shortly after the war, from 1945 to 1947, we undersealed a great many miles of concrete pavement with hot asphalt; the greater part of this work was performed by contract including drilling holes, furnishing and pumping the asphalt. During 1950

and 1951, we have done none of this type of work.

At present, we are mud-jacking some concrete pavements with a mixture we call asphalt-cement slurry. All of this work is being performed by our regular maintenance forces.

Kansas: According to L. J. Siler, Engineer of Maintenance, "Very little of this work has been done in this state. Some work has been done during the last two or three years, but it has been done entirely by highway maintenance forces. We have also experimented with emulsified asphalt mixture, but this work has also been very limited. We have done a considerable amount of cement-soil slurry pumping and this is also done entirely by highway maintenance forces."

"We are contemplating doing a small amount of hot asphalt undersealing, but the amount to be done will not justify contracting and it will be performed by highway maintenance forces."

(Continued from page 74)
large and small sizes.

6. Improper rolling procedure.
7. Poor traffic control during construction and for immediate period thereafter.

E. Poor maintenance.
1. Failure to patch breaks promptly.
2. Poor patching technique.
F. Poor traffic control after construction.
1. Steel shod vehicles allowed.
2. Leaking tank trucks containing bitumen solvents allowed on road.



★ On a West Virginia project—Permajoint Co., subcontractor on undersealing, joint cleaning and resurfacing under a contract by Anderson Bros., Charleston. The men are Harry Shumate, dist. construction engineer, state road commission; A. G. Anderson, pres., W. Va. Black Rock Co.; Cecil Bower, Bureau of Public Roads; Paul Lehman, pres. of Permajoint; and Paul Anderson, of the contracting firm.

Maine, Too, Finds That Open Winters Damage Highways

By John C. Burnham

Assistant to Chief Engineer, Maine Highway Commission

(Published during the Spring in "The Trail," magazine of the Maine Good Roads Association, this statement contains some pertinent observations on the high cost of inadequate roadbeds. Editor)

Warm spells with thawing weather may have heating fuel but they cost thousands of dollars in highway damage. So called open winters take a heavy toll of highway repair dollars, make heavy inroads into car owner repair budgets, and don't improve a motor vehicle driver's disposition.

The State Highway Department is

doing everything possible to keep highway surfaces patched, but regardless of extra crews and the work of regular maintenance forces it is impossible to keep all holes filled as fast as they develop.

Perhaps nature is lobbying and trying to influence legislation, because the present type of weather is certainly showing up the weakness of lightly surfaced highways. The weather Maine has had during the past few winters clearly demonstrates the need for a program of better pavements for heavily travelled highways.

For years the demand has been to build more miles for the dollars available and for that reason Maine now has too many miles of cheaply surfaced highways and too few miles with pavements capable of withstanding the punishment of heavy traffic during the cycles of freezing and thawing.

Thin surfaces composed of a surface treatment of bituminous material cannot withstand traffic when the material under the surface becomes soft as the thawing process takes place.

No serious trouble is being experienced with highways having a reasonably thick surface pavement such as bituminous concrete (hot top), bituminous macadam, Portland cement concrete, or with two inches of crushed stone as is often used in betterment work. Surface pavements of sufficient strength can bridge over soft spots caused by thawing weather where thin surfaces break under the weight of truck wheels.

We have a condition now brought on by the people's desire for more roads than should have been built and have sacrificed quality for quantity. The remedy is to build well what needs building and not build at all that which does not need to be built well.

Two Power Brooms Used in Tandem

(Cover Scene)

A novel labor saving and time saving use of power sweepers is shown in the picture on the BITUMINOUS ROADS AND STREETS cover this month. The Alexander Construction Company of Minneapolis, Minnesota, used this two-broom hook-up during the summer of 1950 on their road job at Forest Lake, Minnesota.

The use of two Littleford brooms saved one tractor and one operator and made it possible to get over a prescribed width of base rapidly, so that equipment could immediately get in and spread windrowed road-mix in the wake of a bituminous prime or tack coat.



...FOR GREATER STRENGTH AND PEAK EFFICIENCY

A vital link in the strength, toughness, and durability of UNIT equipment is the use of involute-splined shafts. Compare the 3 shaft drawings and note the superiority of involute splining. In the outmoded, single-keyway shaft, the driving force is concentrated at one point, making it the least efficient and subject to easy breakage or wear. The 10-spline shaft, commonly used in the industry, is a great improvement over the single-keyway — but is still not the most efficient! Involute splining is better able to take the severe beating of daily use. Its multiple splines allow a greater area of contact with the mating member, providing a more equal distribution of driving force under load. As a result, wear is reduced and replacement is seldom necessary. Involute splining requires less tooth-depth, eliminates sharp corners, thus making possible a shaft of greater diameter and strength. Only the advance design of involute splining gives full, peak efficiency — the reason it is used in every UNIT machine.

UNIT CRANE & SHOVEL CORP.
6407 W. Burnham St., Milwaukee 14, Wis., U. S. A.



This is the 8th of a series of 10 ads describing outstanding UNIT features.



Crawler and Mobile models — 1/2 and 3/4 Yd. Excavators. Cranes up to 20 tons capacity.

SHOVELS • DRAGLINES • CLAMMERS • CRANES • TRENCHERS • MAGNETS

A-3945-1/2-1C



★ Handy ladder on front corner of dump truck body—one of many efficiency betterments possible with welding, as demonstrated by Texas highway department shop employees

Ladder Helps Men Climb Into Truck

The accompanying photo shows an example of the welder's art, as seen in one of the district shops of the Texas Highway Department. Ladder made of round shapes or steel tubing is welded to the front corner of the dump body, in a position which enables the driver or helper to climb up into the truck more easily and safely.

Reconditioning Final Drive Bellows Seals

Five simple tools, quickly and easily made from inexpensive materials found in most service shops, are aiding in the salvage and reconditioning of final drive bellows seals in track-type tractors thereby helping extend the nation's supply of copper and tin.

The materials for repair are readily available, the tools required can be easily fabricated in any shop, and the technique is not difficult, according to engineers at Caterpillar Tractor Co. A program for the conservation of these seals is now being carried on by this firm and its world-wide distributor organization as part of a large-scale, long-range field repair and conservation program involving many parts made of alloy steels, copper, aluminum, brass and bronze going into Caterpillar machines.

These tools include a T-handle for removing bellows seals; a shaping tool or "dolly" with shaping pliers used to "iron out" corrugations, making them smooth and uniform in size; a seal spreader for expanding the seal and exposing the breaks making them accessible for repairs; a crowfoot

**Now you can lay up to 12" thickness
11' wide; lesser thicknesses to 12½'**

In one pass you can now lay as much as 10" of coarse stone, or as much as 12" of finer or graded materials, in 10' to 11' widths, or the same volume of material in greater widths to 12'6" with slightly less thickness. Or lay up to 25' with two of these low-cost spreaders in tandem. Place material as fast as trucks can deliver, to accurate thickness maintained by straightedge runners; blend perfect joints. Proved on hundreds of jobs, from Pennsylvania and New Jersey Turnpikes to city parking lots. Two models, to work with any size trucks.

See your Jaeger distributor now — or send for Catalog SPS-1

THE JAEGER MACHINE COMPANY

223 Dublin Ave., Columbus 16, Ohio

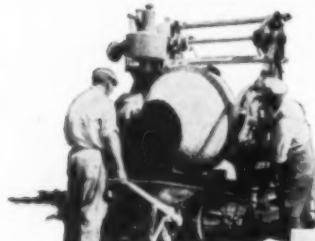
BITUMINOUS PAVERS • CONCRETE SPREADERS, FINISHERS • COMPRESSORS • PUMPS

START YOUR OWN PRE-MIX ASPHALT BUSINESS

Supply Local Construction and
Maintenance Demands with Easy-to-Mix

Bitucote

EMULSIFIED ASPHALTS



START SMALL... GROW LARGE

Here's an opportunity for a profitable local business...supplying BITUCOTE Pre-Mix to others, and filling the needs of your own construction and repair jobs.

BITUCOTE mixes readily with local aggregate, without heating. Non-volatile, too . . . perfectly safe. Mix it in a portable concrete mixer for your own on-location assignments...or supply it to others from a stationary mixing plant. But large or small, this modern material and this service are needed in every community. You can fill this demand profitably.

YOUR PROSPECTS ARE EVERYWHERE: for paving Roads and Streets. Playgrounds, Walkways, Loading Areas, Feed Lots, School Yards, Tennis Courts, etc., etc.

Bitucote Representatives will give you all the technical help you require. Write today

FREE BITUCOTE BULLETIN

Get the complete story on Bitucote. Send for your copy of 4-page Bulletin: "PAVE IT BETTER WITH BITUCOTE"—illustrated information use of Bitucote for Road Mix, Penetration, Plant Mix, Surface Treatment, Base Stabilization.

Bitucote PRODUCTS

Division of BRIDGES PAVING CO.

1411 CENTRAL INDUSTRIAL DRIVE • ST. LOUIS 10, MO.

punch for bringing the retaining rings back to shape on a flat steel plate.

In the past it has been common practice to replace all worn or damaged final drive bellows seals with new parts rather than attempt repair of the bellows. Many bellows are rendered useless because of the serious damage occurring during removal. It is also known that accumulations of mud and dirt plus the adhesive strength of the cement used in assembling the seal gaskets, make bellows seal removal difficult.

However, by careful removal and the relatively easy process of replacing the cork-leather gasket and the cork facing, about 50 per cent of all bellows seals can be returned to immediate service. Many other seals which have been damaged during operation or removal can be successfully repaired by soldering patches of thin brass (salvaged from seals damaged beyond repair) over the fractured area.

On Automotive and Construction Equipment

Books dealing solely with the equipment used by contractors are few and far between. The need for more books of this kind is apparent when it is considered that the value of construction equipment produced yearly is in the neighborhood of one billion dollars.

An excellent book on automotive and construction equipment has been published recently. It is a study in the economical use of this equipment as it relates to management, capacity and investment. It is a book for owners of fleets of trucks and construction equipment, as well as for civil engineering, transportation and military students.

The subject material and format of the book is intended to acquaint the reader with basic information first, such as knowledge of drivers, mechanics, operators, shops and engines and power, which should be learned by those intending to manage investments that go into large fleets of automotive and construction equipment.

The author is C. W. Lindgren, who as a contractor, owner and engineer for thirty years, has supervised the construction of many large projects. Consequently he knows what he is writing about. It is a really worth while book, especially for construction engineers and contractors. They will find in it much useful information on the maintenance and operation of construction equipment.

The book contains 300 pages and costs \$4.50 per copy. It can be obtained from the author, whose address is Box 3620, Washington 7, D.C.





★ Here a pipe arch culvert is being assembled. Also shown is a typical single pipe culvert, showing neat sack arrangement

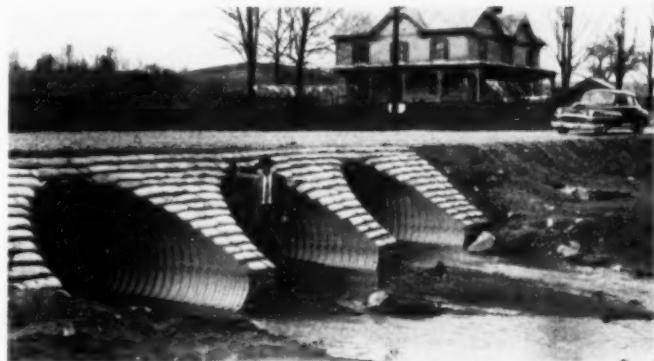


Novel "Sack" Rip-Rap Used in Lieu of Culvert Headwalls

Sacks of sand and portland cement, placed dry and wet down for hardening in place, were employed as a substitute for the usual headwall construction on the culvert installation pictured. This culvert is part of the recent secondary road program of the Tennessee department of highways and public works. The road is between Baileyton and Jonesboro, where alignment and grades were improved on a section passing through several counties. The project included installation of new culverts and surfacing with gravel.

The multiple culvert shown is a triple 107 ft. by 72 in. Armclo multi-plate pipe arch structure having about 15 in. depth of cover over the top of the pipes. The pipe sections were shop beveled to fit the designed slopes. A saving in first cost over concrete headwall construction is indicated. R. L. Iddins was resident engineer, and Malone Brothers of Greeneville, Tenn., contractor.

[Editor's Note: It is hoped that the locations of such culverts will be con-



★ The culverts given sand-cement bag head slope paving included single and multiple installations of varying sizes

spicuously marked as a protection to motorists. The culvert would seem to be invisible from the roadway unless marked.]

Removable Plywood Sign Letters Developed

A new type of removable letter for use in road signs has been developed by the Pennsylvania Department of Highways. Credited to traffic engi-

neer Cartwright in the Franklin District, this sign embodies plywood letters fastened with removable screws, which permits the design of large signs such as those pictured.

A maintenance saving of more than 300% has been effected in certain instances as a consequence of this development, according to the department. Such lettering conserves metals and permits the alteration of signs at little cost and trouble.

★ One of the Pennsylvania signs with plywood letters



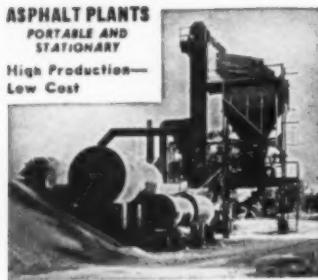
★ The Ohio department of highways this spring, made widespread use of temporary paper "Frost Damage" signs. The signs over wood boards which were attached to permanent roadside sign posts, along rougher roads.



ASPHALT PLANTS

PORTABLE AND

STATIONARY

High Production—
Low Cost

THE McCARTER IRON WORKS, INC.
NORRISTOWN, PENNA.

**Now 424 Miles
of Toll Roads**

The Brookings Institution of Washington, D. C., has released a 204-page report on toll roads. Wilfred Owen and Charles L. Dearing are the authors.

A foreword by Harold G. Moulton, president of the institution, said, "Failure to give proper weight to the importance of the highway system has resulted in excessive transportation costs and inferior service. There is growing realization today that substantial modernization of our highway system must be undertaken to

achieve the economy and quality of service which the vehicle is capable of providing. A significant current approach to this goal is the development of toll highways." The study concludes that:

1. The toll road solution at best can be applied only to a limited mileage of roads.

2. Toll roads offer no solution to the problem of crowded city streets.

3. In rural areas they must be limited to segments of the road system carrying high density traffic in order to assure self-support.

4. Where the toll road is acceptable, its use would not eliminate the need for basic revision of highway financial practices affecting the highway system as a whole.

5. The cost of financing toll roads through revenue bonds is substantially higher than financing by state government bonds.

6. Toll roads undoubtedly constitute a form of "double taxation" in that the user must not only pay the toll but also the gasoline tax, the proceeds of which will be used on other highways.

May Cause Postponement

"On balance, it is concluded that the arguments against the toll road are not of such overriding importance

that they preclude serious consideration of this method of finance," the report said.

It adds that to "reject toll roads on the ground that toll is 'a return to the 18th century thinking' may mean postponement of needed improvements and failure to realize the benefits of 20th century engineering."

There are now 424 miles of toll roads in operation in five states and 350 miles under construction in four states. An additional 1,198 miles have been specifically authorized by five states.

Tolls may not be charged on highways built with federal aid. However, congress has permitted tolls on tunnels and bridges built with federal aid and the study suggests that the law might be amended to include federal aid for toll highways.

**Earth Moving Tip!
Play Safe! You Won't
Be Sorry**

Modern high speed earthmoving equipment requires operators who are alert and safety conscious at all times. The first time common sense safety regulations are forgotten or operators become careless, a serious accident is likely to happen.

Loading. Hauling units are usually loaded by shovels, draglines or clamshells. Occasionally, they are loaded by end loaders or by moving conveyor belt loaders. The thing to remember is that during the time the trucks are being loaded, there are plenty of ways in which an accident can occur, and we've got to be on the lookout for them.

The driver is the one most likely to be hurt during loading operations. If rigs do not have protective cabs, it's a good idea to get off machines while they are being loaded. Drivers will then be protected from loose material during the loading operation.

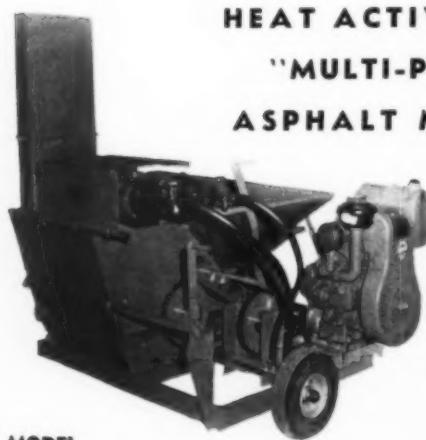
Even with a cab the operator is not completely protected. Although the loading shovel might not swing directly over the hauler, the driver in the cab might be hit with loose material, which could be thrown through the window at the end of the loading swing.

To prevent this kind of accident it's good practice always to get loaded from the rear of the hauling unit. Many construction outfits are very strict about making the driver get off the truck during loading, and many are not so strict. Drivers should get off.

Dipper Danger. Anyone working

McConaughay

**HEAT ACTIVATED
"MULTI-PUG"
ASPHALT MIXER**



MODEL
HD

CABLE: MCCONN

**The Patching Mixer
for Summer or Winter**

**HOT or COLD mixtures.
Unexcelled for patching.
Small jobs a cinch to
complete right on the
site.**

McConaughay
EMULSIFIED ASPHALT
PLANTS AND PROCESSES

K. E. McCONAUGHEY • LAFAYETTE, IND.—U.S.A.

or walking under a shovel, dragline or clamshell bucket is in a danger area. Material might fall or the bucket might drop suddenly. And just because you're wearing a hard hat, don't think you're entirely protected. If rocks should fall from the shovel and hit you on the shoulder, you could be just as badly hurt as if you didn't have a hard hat on.

Loading hauling units with a moving conveyor belt has its hazards too. This type of loader moves along with the truck, dumping material directly into the haulers while both are traveling forward. This operation requires exact timing so material won't be spilled, especially if the rig doesn't have a cab.

That's why we must have alert drivers and why hauling units are kept in order and in good condition. We can't afford to run the risk of having a truck stop in the loading cycle with the result that the load is spilled all over the driver.

Trim your Load. If your job requires hauling through city streets, be especially sure to trim your loads so that loose material won't fall on city streets, cars, or pedestrians. It's equally important to trim loads when the entire haul is within your project area because big chunks of dirt and rock could prove to be a hazard for your own hauling units if dropped on the haul road.

Dumping. Loading is not the only hazardous operation in connection with hauling units. The dumping operation can be just as dangerous. Usually, when end-dumping material, it is necessary to back hauling units to the edge of the dump. One of the best procedures when backing trucks is to have a spotter signal the driver. The spotter should stand so he can see the area in back of the truck that the driver can't see. He must never be behind the truck, but always to the side and in clear view of the driver.

("Construction Safety," April, 1951; published by the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.)

**It Costs Less to
Build Good Roads
Than to Have
Poor Roads**



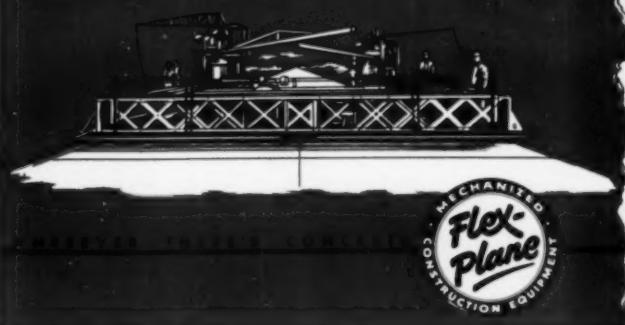
Rising costs of labor and materials are nothing to joke about. It's a situation that calls for action. That's where FLEX-PLANE fits in.

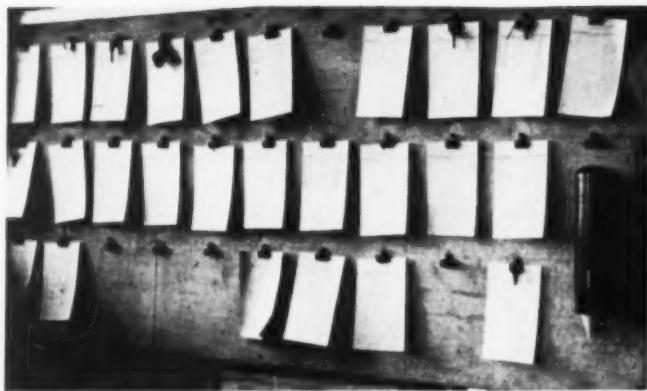
FLEX-PLANE automatic equipment — finishers, curing machines, joint installers,

It's no Laughing Matter!

dowel bar installers and traffic line installers are unsurpassed when it comes to working concrete faster at less cost.

Like many others — who are entering low bids without sacrificing quality — you can combat high costs by writing The Flexible Road Joint Machine Company, Warren, Ohio, for the latest in concrete working equipment.





★ Gasoline purchase reporting is done to these cards by truck drivers for the Butler County Kansas Highway Department

Gas Card Rack

In Butler County, Kansas, the Road Commission with headquarters at El Dorado follows the usual practice of making each driver responsible for his truck or machine. The driver keeps track of all operating costs and makes out a regular report daily. Equipment is assigned against the job during the time the operator is with him.

Shown here is a wallboard located just inside the door of the county

shop at El Dorado. Each card is for entering gasoline purchases for a particular vehicle. These purchases are summarized monthly as part of the cost keeping system. The county's drivers and operators like this handy arrangement, which encourages them to be systematic.

Truck registrations in 1950 increased 7.2 percent over 1949 to a total of 8,604,448 and the nation's motor vehicle fleet grew to 49,143,175

units, the U. S. Bureau of Public Roads reported recently.

The increase in over-all registrations was 4.5 million, with the largest percentage of the increase, 10.7 percent, occurring in automobile registrations. Buses increased 7.1 percent to a total of 223,652 units.

Three states, Louisiana, New Mexico and Texas, reported increases in total registrations of more than 15 percent. Another 11 states reported a motor vehicle growth of more than 12 percent. California, New York, Pennsylvania, Texas, Ohio, Illinois, and Michigan reported registrations in excess of 2,000,000 vehicles each.

Motor vehicle travel on rural roads continued to grow in 1950, reaching an all-time high. The Bureau estimated that 223 billion vehicle-miles of travel was carried on roads outside of cities, an increase of 8.7 percent over 1949. In previous years travel on city streets about equaled that on rural roads. Total travel, the Bureau estimated, was in the neighborhood of .50 billion vehicle-miles.

The growth of motor vehicle travel continues, the Bureau said. During the first three months of 1951 travel on all rural roads has increased 8.4 percent over the same period of 1950.

Louisiana showed the greatest increase in registration in 1950.

CUT ESTIMATING TIME with ROLATAPE

The NEW, QUICK Way to Measure Distances

- Measures as it rolls
- Easy to use
- Accurately calibrated

ROLATAPE accurately measures and records as you wheel it over distances to be measured. Model 200 illustrated records up to 100 feet, repeats cycle after ringing bell. Clearly audible click every two feet permits running count. Measures wall to wall, vertical, overhead and curved surfaces easily and accurately. Rugged steel construction withstands hard field usage. Easy to carry, weighs only 2½ lbs.

ROLATAPE pays for itself in a short time. Speeds up all kinds of estimating and layout work. No extra man needed to help with measurements. Order today to assure prompt delivery. Satisfaction guaranteed. **ROLATAPE, INC.**, 1415 14th St., Santa Monica, Calif.

Fill out this coupon and mail today!

ROLATAPE, INC., Dept. A, 1415 14th Street, Santa Monica, Calif.
Gentlemen: Please send **ROLATAPES** Model 200, at \$17.50 each.
Enclosed is () check () money order for **Money will be refunded if returned within 10 days.**

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Company _____

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ROLATAPE han-
dles roads, 40'-
vet fields, com-
pacts. Wheel is
2½" dia. Other
details available
for longer dis-
tances, rough ter-
rain.

Only
\$17.50



GRACE TRACTOR SWEEPERS



Fit Most Wheel Tractors

Sweep right or left
6' or 8' overall width

GRACE CHIP SPREADERS



For Fast Uniform Coverage

On Seal Coat Jobs

Built-in trailing equipment

Folding operator platforms

Timken bearing wheels

Tires changeable without deflating

W. E. GRACE MFG. CO.

6007 S. Lamar

Dallas, Texas

WITH THE MANUFACTURERS & DISTRIBUTORS

Huthsteiner New Cummins President. Robert E. Huthsteiner, heretofore executive vice president, has been elected president of Cummins Engine Co., Inc., Columbus, Ind. He succeeds J. Irwin Miller, who becomes chairman of the board. Clessie L. Cummins, founder of the 33-year-old company and formerly chairman of the board, was named honorary board chairman.

Major White Returns to Army. Major W. McLean White, Jr., vice president of the White Manufacturing Co., Elkhart, Ind., has been recalled to Army duty. He is now serving as chief of procurement inspection at the Air Force Central Procurement Headquarters in Detroit. He will be in charge of the inspection of Air Force procurement activities covering a five-state area. W. McLean White, Sr., will cover the work of his son with the White Manufacturing Co. in the interim.

Goodyear Promotions. Richard W. Saine, former senior staffman in charge of mechanical goods advertising and sales promotion for the Goodyear Tire & Rubber Co., Akron, O., has been named manager of distributor sales in the com-

pany's Mechanical Goods division, succeeding W. T. Bell, who died recently. Sheldon R. Harper has been placed in charge of sales promotion and advertising for the Mechanical Goods division, succeeding Mr. Sabine.

Bob Johnson Is Dead. Clarence R. Bob Johnson, district representative for the western sales division of Caterpillar Tractor Co. since 1940, died suddenly June 13 of heart attack.

McKee Appointed Chief Engineer. Dale McKee has been appointed chief engineer of Lull Manufacturing Co., Minneapolis, Minn. He formerly was group engineer at Bell Aircraft Corporation in Buffalo, N. Y.

Named Trade Sales Manager. John E. Powers, heretofore manager of automobile tire sales, has been appointed trade sales manager of The General Tire & Rubber Co., Akron, O. He will be responsible for General's replacement tire sales program, and also the direction of the Akron and field sales personnel.

Appointed Assistant Sales Manager. G. E. Gunther, heretofore district sales manager for the central territory, has been appointed assistant sales manager of The Shovel Co., Lorain, O. He has been in the construction equipment industry since 1936.

Mack Appointment. R. W. Allen, for the past 10 years manager of the Mack Houston branch, has been appointed district manager of the St. Louis branch of Mack Motor Truck Corporation.

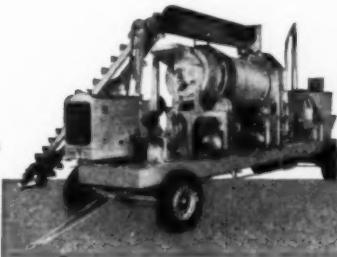
Howard and David Retire. Harry W. Howard, manager of the Pacific region of GMC Truck and Coach Division at Oakland, Calif., has retired after 29 years of continuous service. J. W. David, GMC zone manager at Los Angeles, has retired after 21 years of continuous service. The Los Angeles and Oakland zones have been merged under F. A. Hoyt, zone manager. He will be responsible for GMC activities in California, Arizona and the western part of Nevada.

New President for Sterling Engine. Kenneth S. Thomson, formerly executive secretary of Chevrolet Association of Credit Men, has been elected president of Sterling Engine Co., Buffalo, N. Y.

A-C Opens New Branch Building. Allis-Chalmers, Milwaukee, Wis., has opened a new factory branch at 4646 Peachtree Blvd., Atlanta (Chamblee), Ga. The structure has 60,000 sq. ft. of floor space, plus 8,000 sq. ft. of docks for truck and rail shipments.

Reemelin Named Sales Manager. Ben Reemelin, formerly in charge of dealer sales for Toro, has been appointed sales manager for Coldwell-Philadelphia, a subsidiary of Toro Manufacturing Co., Minneapolis, Minn.

Harlow Appointed Sales Manager. Charles P. Harlow, heretofore assistant district sales manager in the Boston office, has been appointed sales manager of the Hardware Products Department of the Wickwire Spencer Steel Division of The Colorado Fuel and Iron Corporation. He succeeds William Sewert, who has resigned.



Portable Asphalt Plants For City, State, Repairs and Small Contract Work

These 8-10 tons per hour Asphalt Plants economically repair almost any pavement. Asphalt, brick, concrete, macadam, can be resurfaced or patched. Alleys, driveways, sidewalks, industrial plants can be paved.

Produce for immediate hot laying, or for deferred cold patching. Match any bituminous surface.

Mixes at plant, including labor, fuel, and overhead, cost about \$4 per ton, with \$2 aggregate. Average 160 to 200 sq. yds. 1" thick per hour. A money-maker for small contract work.

Also larger plants, 15 and 30 tons per hour.

Write for catalog and name of nearest dealer.

Elkhart White Mfg. Co., Indiana



OVERMAN'S STONE AND BITUMINOUS SPREADER

MUNICIPAL HIGHWAY DEPARTMENTS say—
"With it we get better and longer lasting roads."

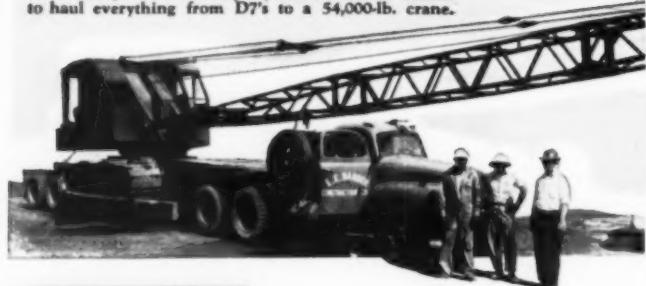
CONTRACTORS say—

"Its fast operation means more jobs and more profit. Can't afford not to own one."

WRITE FOR BULLETIN

I.J. OVERMAN MFG. CO.
BOX 203
MARION, IND.

E. E. Barber (right), shown with E. E. Barber, Jr., and M. C. Brown, is head of the E. E. Barber Construction Co., Fort Smith, Ark. The company uses its Martin Trailer to haul everything from D7's to a 54,000-lb. crane.



SAVE... TIME IN LOADING-UNLOADING
ELIMINATE... DETOURS AROUND LOW CLEARANCES
HAUL... MORE PAYLOAD

WITH MARTIN "FOLDING GOOSENECK" TRAILER!

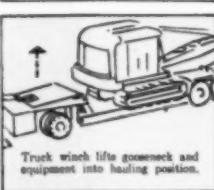
■ E. E. Barber, Fort Smith, Arkansas, says, "The Martin 'Folding Gooseneck' Trailer is superior to any trailer I've used or seen. It saves time in loading, its low height provides ample clearance, its weight allows more net load."

The "Folding Gooseneck" does away with the dangers and time of building loading and unloading ramps and blocking . . . low platform height carries equipment of every type under low bridges, wires and underpasses . . . rugged, all-welded, frame construction cuts dead weight and allows big loads to be carried within legal limits.

Martin "Folding Gooseneck" Trailers are the most modern answer to equipment hauling problems. Ask your Martin "Caterpillar" Dealer about the size that can save on any haul for you. Do it today!

MARTIN MACHINE CO., Kewanee, Ill., U.S.A.

**HOW THE MARTIN
 "FOLDING GOOSENECK"
 WORKS and SAVES**



MARTIN
Trailer Co.

**KEWANEE
 ILLINOIS, U.S.A.**

Appointed to Research Committee. Rene D. Wasserman, director of research and president of Eutectic Welding Alloys Corporation, Fushing, N. Y., has been appointed to the research committee of the National Association of Manufacturers.

Toro Buys new Plant. Toro Manufacturing Corporation, Minneapolis, Minn., has purchased a new plant at Windom, Minn., from the Moers Co. Windom will go into operation in the fall, when additions to the present building are completed. Assembly of reel type power lawn mowers and allied machine tools will henceforth be handled there instead of the home plant in Minneapolis.

Roper Promoted by Aircos. Edward H. Roper has been appointed manager of the general technical sales department of Air Reduction Sales Co., New York, N. Y. He was formerly assistant manager of the department.

New Hyster Appointment. Graydon Broms has been appointed district representative for Hyster Co., Portland, Ore. His territory includes most of Oregon, Washington, Idaho, Western Montana, Yukon Territory, British Columbia and Alaska.

Thompson Materials Corp. Appointments. Bernard L. Berman has been appointed manager of road sales for Thompson Materials Corporation, Belleville, N. Y. He has been in the sales department for 14 years. J. Walter Lauer, Jr., has been appointed sales promotion manager for new products.

Davis Promoted by C F & I. Howard
 J. Davis, heretofore assistant to the vice president of sales of Colorado Fuel & Iron Co., has been appointed assistant to the executive vice president A. F. Franz.

Edwin H. Parkhurst Dies. Edwin H. Parkhurst, 79, former president of The Euclid Road Machinery Co., Cleveland O., died June 22. He served as president of the Company from 1937 until recently when R. Q. Armington was elected to the position.

Elected Executive Vice President. John P. Courtright has been elected executive vice-president of The Marion Power Shovel Co., Marion, O. For several years he served as vice-president in charge of sales and service and continues in this capacity in his new position.

New Adnun Distributor. The Square Deal Machinery & Supply Co., of Orlando, Fla., is now handling both the Adnun black top paver and the MultiFoote paver line for the Florida area.

Joins Timken Advertising Staff. Bob Wagner, who has been narrating and writing The Timken Roller Bearing Co.'s "Message to Americans" radio program, has joined the advertising department at the Timken plant in Canton, O., as manager of the bureau and related public relations work.

Renner Appointed General Sales Manager. John E. Renner has been appointed general sales manager of Lincoln Engineering Co., St. Louis, Mo. He has been associated with the firm for 15 years, and has successively held positions of sales representative, automotive merchandise manager, and sales manager of the Automotive Division.

NEW EQUIPMENT AND MATERIALS

1

Electrical Tape

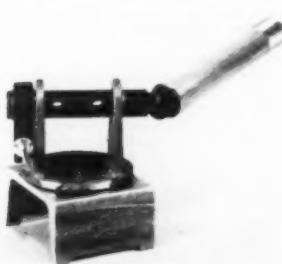
A new type electrical tape, made with Koroseal material, and said by the manufacturer to have many advantages over ordinary electrical tapes, has been announced by The B. F. Goodrich Co., developers of Koroseal. Among the advantages of the new product, the company says, are the following: The adhesive is non-transferring, and can be pressed onto a dry surface innumerable times without losing its stickiness. It will not transfer the adhesive from the face, lose its tackiness, or ability to adhere, sticks snugly and securely to itself and insulation around copper wire. The tape has a dielectric strength of 8000 volts, is waterproof, highly abrasion resistant and flameproof, resistant to acids, oil alkalies and corrosive salts. The B. F. Goodrich Co., Dept. RS, Akron, O.

For additional information circle number of this item on Readers Service Card.

2

Form Tie

A wire forming and tying tool, announced by Pipe Form Tie Co., is scientifically engineered and precision made. It is of cast bronze, aluminum and steel construction. It will handle all wire sizes to and including No. 7. It forms and ties



Pipe Form Tie

wire, and the tool can be removed within 30 seconds. The unit was developed originally for tying forms for concrete. It will tie on 2 x 4 and 4 x 4 in wales and studs. Pipe Form Tie Co., Dept. RS, 3802 N. Attu, Portland 17, Ore.

For additional information circle number of this item on Readers Service Card.

3

Impactool for Tough Nut Jobs

A new, heavy duty universal electric impactool for tough nut running jobs in truck, bus, and industrial maintenance fields has been announced by Ingersoll-Rand Co. Known as the Size 34U impactool, it has a 1 in. square driver, and is rated for bolts up to 1 1/4 in. size. The 34U employs a heavy duty, universal electric motor and a proven 1-R impact unit, placed side by side to reduce overall height, which permits handling truck U-bolt nuts without jacking up the truck.



Size 34U Impactool

The impact mechanism automatically converts the power of the electric motor to hundreds of rotary impacts whenever sufficient resistance to turning is met. These powerful rotary impacts quickly run nuts up tight, or remove the most stubborn rusted or frozen nuts. Due to the unique design of the impact mechanism, no kick or twist is transmitted to the operator under any condition. The 34U is quickly reversed by an easy-to-grip switch, located for convenient operation. Ingersoll-Rand Co., Dept. FP, 11 Broadway, New York 4, N. Y.

For additional information circle number of this item on Readers Service Card.

4

Portable Radio Phone

A new version of its "Handie-Talkie" portable FM radiophone, being introduced by Motorola, incorporates an adjustable squelch, which reduces the annoyance of tube and circuit noises normally encountered in an F.M. receiver in the absence of a signal. The squelch control, mounted on the power supply chassis, provides a normal operating range of no-squelch up to 25 to 50 db noise reduc-



Motorola Portable Radiophone with Adjustable Squelch Facilities

tion. Any possible audio distortion resulting from the portables being used in fringe areas is eliminated as a result of the addition of the adjustable squelch. The "Handie-Talkie" portables are available with either wet or dry cell power supplies for operation in either the 25-50 megacycle or the 152-174 megacycle bands. Motorola, Dept. RS, 4545 W. Augusta Blvd., Chicago 51, Ill.

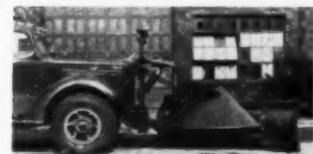
For additional information circle number of this item on Readers Service Card.

5

Blade Snow Plow

Three models of a new reversible trip blade snow plow for use on trucks with a capacity of 1 1/2, 2 to 4 and 5 to 10 tons have been added to its line of "V" type and one-way blade type by Frink Sno-

Plows, Inc. This new reversible snow plow is stated to be of entirely different construction from the ordinary trip blade plow. The drive frame assembly is pivotally connected to a conical semi-circle which permits the moldboard to follow the contours of street and road surfaces without imposing twisting strains on the truck chassis. Four different right or left plowing angles in addition to one of 0° for bulldozing are available. A unique



Frink Reversible Trip Blade Snow Plow

preloaded trip spring with moldboard linkage maintains a more constant pressure during the entire tripping cycle and prevents the chatter at the cutting edge. This trip mechanism is all enclosed in the conical semi-circle shown. After passing an obstruction it quickly returns the moldboard to working position without jumping up and losing snow at the ground line. The moldboard is readily adjustable to either of two positions—for plowing—or for scraping. This new reversible trip blade plow is interchangeable with the Frink "V" type and One-Way blade type Plows using the same truck attachments. Frink Sno-Plows, Inc., Dept. RS, 205-227 Webb St., Clayton, N.Y.

For additional information circle number of this item on Readers Service Card.

6

Improved Lift Truck Wheel Design

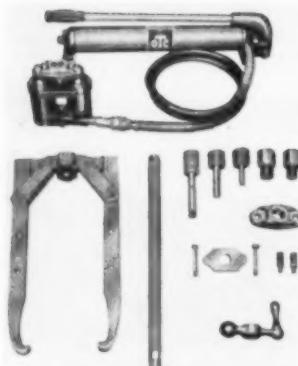
Easier, almost effortless steering, further reducing operator fatigue with resultant increase in materials handling, is claimed to have been made possible by an improved wheel design on the Model YT-40 (4,000-lb. capacity) fork lift truck of the Hyster Co. All model YT-40 lift trucks now are being equipped with dual wheels instead of a single wheel on the steering trunnion. Present single-wheel type Model 40s can be converted, if desired, to dual wheels with a minimum of alteration. The removal of one easily accessible lock stud permits rapid and convenient tire service and maintenance. The new design also has reduced the gear ratio in the steering mechanism from 31 to 1, to 20.7 to 1, requiring only seven turns of the steering wheel instead of 10.3 formerly to swing the trunnion 120 degrees. Hyster Co., Dept. RS, 2902 N.E. Clackamas St., Portland 8, Ore.

For additional information circle number of this item on Readers Service Card.

7

Puller Conversion Set

A new conversion set which easily, quickly and inexpensively adapts OTC screw operated pullers to the OTC power-twin hydraulic puller has been announced by Owatonna Tool Co., 435 Cedar St., Owatonna, Minn. The set converts, it is stated, to hydraulic power most industrial and diesel sets and all refrigeration and aviation sets. Only a few parts are said to be necessary to speed up really tough jobs by at least



OTC Puller Conversion Set

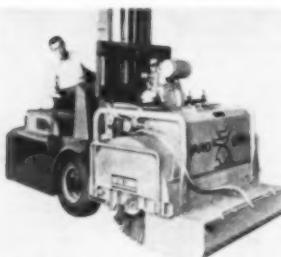
50% save time and money and avoid damage to expensive parts. Set consists of Y-17, 17 1/2 ton power-twin ram and pump assembly plus adapter parts.

For additional information circle number of this item on Readers Service Card.

8

Sweeper Attachment for Fork Lift Trucks

A new low-cost powered sweeper introduced by Little Giant Products, Inc., is designed as an attachment to fit any fork lift truck of 1,500 lb. capacity, and up. It is claimed the sweeper, operated by the lift truck operator, can clean indoors and out as rapidly as 80,000 sq. ft. per hour. This coverage, the manufacturer claims, is with the truck traveling at the



"Yard Bird" Sweeper

rate of 5 miles per hour. Simply attached to become an integral part of the lift truck during cleanup hours, the sweeper has its own self-contained spray system for dust control. A 6.8 HP gasoline engine turns at 2,400 r.p.m., but an integral clutch reduction unit and sprockets step down brush revolutions to 164 r.p.m. The new sweeper is of the pick-up type, with brush whisking dirt and refuse into a full-width floating dust pan. Little Giant Products, Inc., Dept. RS, 1530 North Adams St., Peoria, Ill.

For additional information circle number of this item on Readers Service Card.

9

Calculating Machine

A new calculating machine announced by the Friden Calculating Machine Co., Inc., is entirely automatic and extracts

square roots and automatically points off the correct decimal in the root through entry of the number and touch of one key. With this machine it is stated to be possible to extract the square root of 10 digit numbers in 9 seconds. Friden Calculating Machine Co., Inc., Dept. RS, San Leandro, Calif.

For additional information circle number of this item on Readers Service Card.

10

Pedestal Press for Puller

A new pedestal press for use with its power-twin hydraulic puller has been announced by Owatonna Tool Co. The press is portable and compact, the base being only 20 in. x 21 in. It takes up very



OTC Pedestal Press

little room, but it is stated to be big enough to handle 95 per cent of the jobs in a contractor's shop, garage, fleet, or implement shop. Designed especially for use with the OTC power-twin 17 1/2 ton ram, it can be located almost anywhere in the shop or can easily be moved to jobs as desired. The press is especially practical for maintenance operations on all types of motive equipment. Mounting a strong, practical, open-throat press plate it is claimed to provide almost unlimited vertical adjustment for pushing or pulling jobs—may be used for removing or installing pinions, bearings, gears, shafts and bushings. Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.

For additional information circle number of this item on Readers Service Card.

11

Tool Container Line Improved

Addition of a PROTO master tool chest and redesign of two socket set boxes have been announced by Plumb Tool Company. The new tool chest, No. 9997, measures 27 in. x 12 in. x 15 in. high. It has two full width 2 1/4 in.-deep 2-compartment drawers, four half-width 1 1/4 in.-deep 3-compartment drawers, a full-width top section partitioned into three compartments, and a 21 1/4 in.-wide tote tray with three compartments. Strength and rigidity are secured by the use of heavy-gauge steel, welded construction, double-walled sides, double-reinforced



New PROTO Master Tool Chest and Re-designed Socket Wrench Set Boxes

top and bottom, and rounded corners. Both the PROTO No. 5295 and No. 5495 socket wrench boxes, for 5/8 in. and 1 1/2 in.-drive sets, respectively, were completely redesigned. Plumb Tool Company, Dept. RS, Los Angeles, Calif.

For additional information circle number of this item on Readers Service Card.

12

Flashing Beacon for Problem Corners

A new Neo-Flasher "Stop or Caution" warning light, announced by Light Products, Inc., is completely portable and self-contained and is designed for those problem corners where expensive wiring, trenching, and conduit makes the installation of wired flashing lights impractical. This Neo-Flasher can be easily installed on the existing "Stop or Caution" sign posts in a matter of 10 minutes. Only three, small, 6-volt, dry cell batteries are needed to supply a brilliant, flashing light continuously for approximately 120 days and nights. Meeting standard traffic control specifications with the standard 8 1/2 in. lens Neo-Flasher is available with either red for



Neo-Flasher Model 5-100

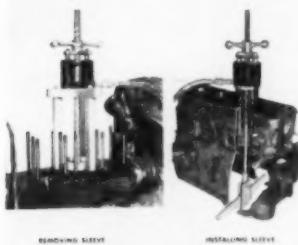
stop signs or yellow for caution signs and being much larger than the usual flashing beacon, it attracts more attention and insures more effective traffic control. A patented gas vapor tube provides one of the greatest labor-saving features of Neo-Flasher in that it will never burn out, thus eliminating the costly procedure of replacing burnt out incandescent bulbs. Light Products, Inc., Dept. RS, 407 Commercial Center St., Beverly Hills, Calif.

For additional information circle number of this item on Readers Service Card.

13

Puller Removes—Installs Sleeves

A special sleeve pulling and installing set as part of its power-twin hydraulic pulling system, announced by Owatonna Tool Co., will pull and install cylinder liners on more than 200 different makes and models of trucks, tractors and power units. The OTC power-twin sleeve puller



OTC Hydraulic Puller

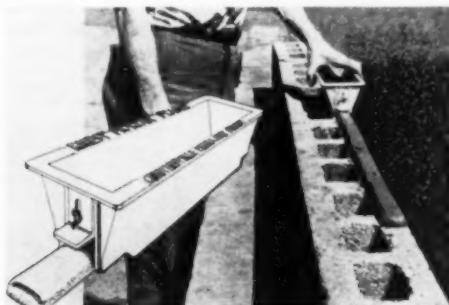
is adjustable to center perfectly over the bore and to provide clearance over cylinder head studs. It removes and installs sleeves from 3 in. to 6 in. without damage or distortion. Present OTC sleeve pullers may be adapted to the Power-Twin Hydraulic Unit by adding only a few parts. Owatonna Tool Co., 435 Cedar St., Owatonna, Minn.

For additional information circle number of this item on Readers Service Card.

14

New Tool Speeds Laying Mortar

A 1½ lb. all aluminum tool for applying mortar, announced by Kakest Co., is stated to lay mortar on concrete or cinder block up to 4 times as fast as the conventional trowel method. Promises to



Kakest Mortar Plane

save 50 hand movements and 10% mortar waste. Gates at base permit various thicknesses of mortar to flow evenly. A guide assures user of fast straight travel up to 6 blocks with one filling. Kakest Co., Dept. RS, Curwensville, Pa.

For additional information circle number of this item on Readers Service Card.

15

Spring Mounted 22 Ton Euclids

Two new rear-dump models of 22-ton capacity with spring mounted drive axle have been announced by Euclid Road Machinery Co. The Model 45TD is powered by a Buda engine of 286 h.p., and the model 46TD has a 300 h.p. Cummins engine. Both models have a 10-speed transmission and are available with standard or quarry body. A heated body which



Model 45 TD Rear-Dump Euclid

speeds the dumping operation during cold weather operation is available as optional equipment. Top speed with full payload is 32 m.p.h. The Euclid double reduction planetary type drive axle is mounted on free-floating springs and is positioned to the frame by swivel-connected longitudinal radius rods. This mounting permits movement of the springs in the spring brackets and avoids the leaf breakage caused by twisting on rough haul roads. The Euclid spring suspension provides for varying the spring contact centers according to the load—a longer, flexible spring for an empty unit and a short, rigid spring for heavy loads. This assures a smooth, comfortable ride and permits faster travel speeds on the loaded and return haul. Euclid Road Machinery Co., Dept. RS, Cleveland 17, O.

For additional information circle number of this item on Readers Service Card.

16

Induction Motors

General Electric's Tri-Clad line of single-phase, capacitor, induction motors is now being offered with a resilient-base construction. For use where freedom from vibration and extra-quiet operation are required, the construction is

available on motors rated from $\frac{1}{2}$ to 5 horsepower. Dynamically balanced for smooth operation, the Tri-Clad motor is stated to offer triple protection against physical damage, electrical breakdown, and operating wear and tear. Of cast iron construction, it features a totally-enclosed built-in transfer switch to keep foreign matter from the contacts, and a centrifugal mechanism designed for long life. General Electric Co., Dept. RS, Schenectady 5, N. Y.

For additional information circle number of this item on Readers Service Card.

17

Air Compressor

A new air compressor, the Model 210 Unistage, has been added to the Schramm line. With an actual air delivery of 210 cu. ft. per minute, the six cylinder engine and six cylinder compressor unit is designed for continuous heavy-duty twenty-four hour service. One of the important features of the 210 Unistage



Schramm Model 210 Unistage Compressor

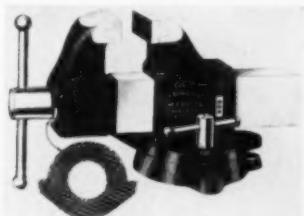
Compressor is the fact that 90% of the engine parts are interchangeable with the compressor. This simplified design eliminates two-staging and inter-coolers, also requires fewer parts. Pneumastat control is stated to cut fuel costs up to 50%. Electric starting, speed control, cam operated mechanical intake valves, dual fan belts, are some more of the many features found in this modern compressor. Schramm, Inc., Dept. RS, West Chester, Pa.

For additional information circle number of this item on Readers Service Card.

18

Machinists' Vices

An improved line of Columbian malleable iron machinists' vises has an outstanding feature—a new type graphite-bronze self-lubricating thrust bearing located at the front of the sliding jaw. This absorbs thrust of the steel screw head, provides easy and positive operation, at the same time preventing wear and eliminating "end play." The manufacturer states that, because of this bearing, Columbian vises can be "pulled up tighter and held more securely—with less pressure than is required by ordinary vises." Another important and prac-



Improved Columbian Vise

tical feature consists of steel ball handle ends which are forged from the handle stock itself. These cannot come loose. Columbian Vise & Mfg. Co., Dept. RS, 9021 Bessemer Ave., Cleveland 4, O.

For additional information circle number of this item on Readers Service Card.

19

Portable Power Saw and File

A new portable power saw and file introduced by E-Z Way Tool Co., is a precision engineered, heavy duty unit that attaches directly to electric or air drills, or flexible shaft for power. The unique mechanism of the unit converts the rotary action of the power unit to a fast, reciprocating motion. By inserting an ordinary hack-saw blade in the holder, a fast power-saw is provided that will quickly cut through all metals including tough stainless steel, Monel and difficult



E-Z Saw

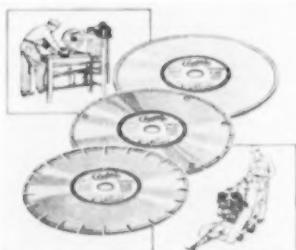
corrugated stock; also wood, plastics, composition and other materials. It can be quickly converted to a power file by simply inserting a machine file in place of cutting blade. Operates with rapid $\frac{1}{8}$ in. stroke and is practically vibration-free. Special blades are available for extremely heavy cutting operations. Saw tooth arrangement eliminates gummed teeth when sawing plastics and other like materials. E-Z Way Tool Co., Dept. RS, 549 W. Washington St., Chicago 6, Ill.

For additional information circle number of this item on Readers Service Card.

20

Diamond Blade for Cutting Concrete

Diamond blades have been perfected by Clipper Manufacturing Co. for cutting asphalt and concrete. These new blades are in addition to the 36 specifications of Clipper diamond blades especially designed for the cutting of hard-vitreous materials (glazed tile, brick, glass block, marble, etc.) on masonry saws. It



Clipper (Concrete) Diamond Blades

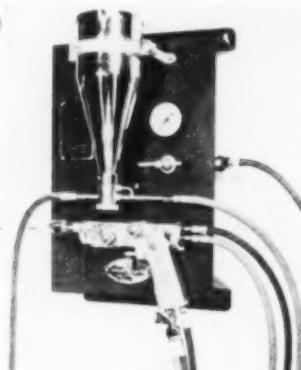
is stated that with the new blades concrete containing limestone aggregate can be sliced up to 10 ft. per minute when cutting at a depth of 1 in. Asphalt containing the same aggregate, and cut to the same depth, can be sliced at the rate of 12 ft. per minute. Specifications of the new Clipper (concrete) diamond blades are available for all types of aggregate and age of concrete. These blades are manufactured in diameters from 8 in. to 18 in. and in thicknesses of 5/32 in. to 7/64 in. for use on any type concrete saw. Clipper Manufacturing Co., Dept. RS, 2800 Warwick, Kansas City 8, Mo.

For additional information circle number of this item on Readers Service Card.

21

New Model Spraywelder

A new model of its spraywelder, announced by Wall Colmonoy Corp., incorporates many new features, such as: Lighter weight; eye level air gauge; new



Model B Spraywelder

greater capacity air filter; air regulator at convenient height; more positive air and powder control valves; new trigger mechanism; finger tip control with lock for continuous or intermittent spraying; increased cooling chamber in head assures steadier operation and longer tip life; locked feed mechanism on carburetor eliminates possible change in powder feed setting. Wall Colmonoy Corp., Dept. RS, 19345 John R St., Detroit 3, Mich.

For additional information circle number of this item on Readers Service Card.

22

Heavy-Duty Clutch Facings

Standee Brake Lining Co., Houston, Tex., one of the largest manufacturers of brake linings in the oil industry, has now entered the clutch facings field. The company is now producing and marketing a new heavy-duty clutch facing in both the gear tooth and plain discs types for use in the earth-moving, oil production, marine, and heavy transportation equipment industries.

For additional information circle number of this item on Readers Service Card.

23

Larger Size Earth Augers

Three larger sizes of the Pengo twin-helix earth auger for use with heavy

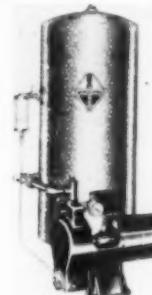
duty power earth boring machines are now in production by Petersen Engineering Co. With diameters of 42 in., 48 in., and 54 in. respectively, the three new augers are designed for use with all popular makes of earth boring machines, as are the 11 sizes (ranging from 10 in. to 36 in.) previously announced. It is claimed that the unique design of the Pengo auger results in fast cutting with minimum power requirements. An additional feature claimed for Pengo augers is their ability to bore a clean, true hole of the specified diameter, eliminating wasted concrete on poured-in-place piers and footings. Petersen Engineering Co., Dept. RS, Santa Clara, Calif.

For additional information circle number of this item on Readers Service Card.

24

Jet Pump

A horizontal jet pump to meet pumping conditions of both deep and shallow wells has been developed by Jacuzzi Bros., Inc. This pump, named the "Speedi-Prime" because of its rapid self-priming features, is a basic pump, which may be installed with the injector at the pump base above the ground surface for lifts



Jacuzzi Speedi-Prime Pump

not greater than 25 feet. For depths up to 120 feet, the injector may be installed in the well, using the same basic pump. The Jacuzzi Speedi-Prime may be installed as a shallow well water system and later converted to a deep well unit. This conversion factor is very important in many areas where the water table is lowering and deep well pumping is anticipated in the future. Jacuzzi Bros., Inc., Dept. RS, Richmond, Calif.

For additional information circle number of this item on Readers Service Card.

25

Low Speed Gear for Tractors

A low-speed gear group to improve tractor-scrapers performance for Caterpillar DW10 tractors, especially in pusher-loading earthmoving operations is now being manufactured by Caterpillar Tractor Co. The new gear permits DW10 tractors to operate at lower speeds for better synchronization with the speeds of pusher track-type tractors in pusher-loading scraper operations. First gear speed of DW10 tractors is reduced from 2.8 miles per hour with the new gear group. Second gear speed of Cat D8 track-type pusher tractors is 2.3 miles per hour and D7 tractors, 2.2 miles per hour. These matching operating speeds between pusher tractor and tractor-scaper unit, are stated to result in bet-

ter loading efficiency. The low speed gear group also provides a greater potential tractive effort for self-loading operations. The remainder of the forward and reverse gears of the low speed gear group are the same as the standard group. Caterpillar Tractor Co., Dept. RS, Peoria 8, Ill.

For additional information circle number of this item on Readers Service Card.

26

Lifting and Loading Boom

A new heavy-duty boom, designed especially for lifting and loading with the 5-ton truck-mounted Bantam shovel-crane, announced by Schield Bantam Co., is stated to have approximately four times more rigidity than standard booms, due to the use of heavier reinforcing and bracing to resist shock and sling load conditions. Approximately 200 lb. more



New Heavy-Duty Boom. Bantam Shovel Cranes.

steel strength is achieved with heavy duty angles, together with additional braces along the lower section for protecting boom when dropped or bumped against other objects. The boom is available in 25 ft. lengths, with 5 ft. extensions. The crane is said to be conservatively rated at 10,000 lb. capacity at 10 ft. with outriggers and 1000 lb. counterweight. Schield Bantam Co., Dept. RS, Waverly, Ia.

For additional information circle number of this item on Readers Service Card.

27

Starting Motors for Engines

Two new air starting motors for cranking gasoline and diesel engines are announced by Ingersoll-Rand Co. They are designed for cranking diesel and gasoline engines with piston displacements up to more than 3500 cu. in. Although normally operated by compressed air, they are also suitable for operation on natural gas where available at sufficient pressure. The starters are available in two sizes: the Size 9BM, which develops up to 16 hp and requires approximately 7 cu. ft. of air per start; and the Size 20BM, which develops up to 41 hp and requires approximately 16 cu. ft. of air

per start. The smaller size weighs 40 lb., and the larger size 103 lb. Ingersoll-Rand Co., Dept. RS, 11 Broadway, New York 4, N. Y.

For additional information circle number of this item on Readers Service Card.

28

Power Unit for 2-Way Radio

A new pack set power supply, announced by Motorola Inc., is designed to increase the utility of the Motorola F.M. 2-way radiophone pack unit by making it convertible to semi-fixed or mobile application while preserving the dry battery supply for portable operation only. A plug-in power connection and switch-



By one bolt the Power Supply is attached to the firewall of a car or truck and then the Motorola Pack Set can be operated off the vehicle battery.

ing facilities on the pack unit permit quick and easy transfer from internal dry battery power supply to an external power source. The power supply makes it possible to operate the pack set from either a 117-volt A.C. or a 6-volt D.C. primary power supply. Motorola Inc., Dept. RS, 4545 Augusta Blvd., Chicago 51, Ill.

For additional information circle number of this item on Readers Service Card.

29

Heavy-Duty Fenders for Cat Tractors

Heavy-duty fenders previously offered as an attachment for Cat D8 tractors have now become standard equipment, it is announced by Caterpillar Tractor Co. These stronger fenders are manufactured from $\frac{1}{2}$ in. steel plate and will provide a more rigid platform for mounting equipment. The announcement said that the heavy-duty fenders will also withstand greater abuse and rough treatment sometimes encountered in pioneering and logging operations. Effective with this change, heavy-duty fenders are now standard on both D8 and D4 tractors. It is anticipated that heavy-duty fenders will also become standard equipment for D7 and D6 tractors within the near future. Caterpillar Tractor Co., Dept. RS, Peoria 8, Ill.

For additional information circle number of this item on Readers Service Card.

30

Cement Distributor

A two-wheeled rubber-tired cement distributor for use with either bulk cement trucks or sack cement has been introduced by Wood Manufacturing Co. The distributor is attached directly behind the cement truck. Cement is dumped into the hopper on the distributor and



Wood Cement Distributor

by means of a calibrated rotary vane is metered on to the windrow. Windrow is automatically troughed by an axle-high V-spreader on the front of the distributor, which protects the cement from blowing. The distributor has an adjustable capacity of 15 to 80 lb. per linear foot. It is easily attached to truck and can be maneuvered on the job by one man. Wood Manufacturing Co., Dept. RS, Box 620, 6900 Tujunga Ave., North Hollywood, Calif.

For additional information circle number of this item on Readers Service Card.

31

25-Ton Hydraulic Jack

A 25-ton capacity hydraulic jack of distinctly new design, announced by Templeton, Kenly & Co., has as an outstanding feature identical lifting capacity for the toe and on the cap. The toe rides on a bearing roller that carries the radial head against a stationary ram's flat-milled surface. The whole lifting operation is said to be smoother and easier because the broad $4\frac{1}{2}$ in. x $4\frac{1}{2}$ in. toe always remains in an even position. The jack has a 7-in. lift, with minimum heights of $2\frac{1}{2}$ in. when lifting on the toe and 14 in. when lifting on the cap. Other benefits claimed are the fact that the ram does not travel—and sturdy integral construction of the head toe shortens off center loading and brings the toe closer to the center of the ram. Equal efficiency is obtained in an upright or horizontal position. The oil reservoir is independent of the load-lifting housing to eliminate pressure stress and prevent oil leakage. Templeton, Kenly & Co., Dept. RS, 1020 South Central Ave., Chicago 44, Ill.

For additional information circle number of this item on Readers Service Card.

32

Crawler Tractor

A new crawler tractor, called the GT 30 Terratrac, has been introduced by the American Tractor Corporation. This multi-purpose tractor is powered by the four



GT 30 Terratrac

18 ROLLER BEARINGS in UTIL STEERING ASSURES EASIER HANDLING!



Here's why MM
is easier handling!

Precision made anti-friction bearings at all important points of the UTIL steering assembly, extra large molded rubber steering wheel, and front wheels inset over steering knuckle pins are exclusive UTIL design features. They help to make UTIL handle easier and permit the use of heavy-duty front-end loaders of maximum capacity.

The steering gear cam is ground to give increased leverage on turns—faster action on straight travel—*easier handling and more profitable operation on all jobs.*



Four heavy tapered roller bearings in front wheels, are but part of the quality construction that makes for easier handling. Six roller bearings in the heavy Ross gear, six rollers in the steering knuckles and two large rollers in the tie rods are quality features.

See your MM Dealer-Distributor or Write



MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

cylinder Continental F-140 engine and includes other well known standard parts. It is designed for a wide range of construction and industrial applications. When fully equipped with hydraulically activated bulldozer and angle dozer, the tractor weighs less than 4,400 lb. Special rubber track shoes have been developed for the tractor, permitting it to take advantage of its 4.98 m.p.h. third speed. Interchangeable gauge widths ranging from 42 to 72 inch, the use of five lower track rollers, and high ground clearance are stated to give the Terratrac extra stability in hilly, sandy or muddy terrain. American Tractor Corporation, Dept. RS, Churubusco, Ind.

For additional information circle number of this item on Readers Service Card.

33

Side Dump Trailers

A new and improved model TP trailer, announced by Easton Car & Construction Co., provides a 12% increase in water-level capacity with no increase in overall dimensions, as compared to previous models of this pan-type trailer. Load distribution has been improved to place more load on the fifth wheel, thus providing better traction on the tractor axle. The new all-welded body design features a new and stronger edge construction.



Eastern Model TP Trailer

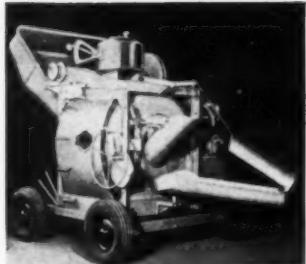
Box section reinforcements are used throughout. A 3 in. oak floor cushion and replaceable carbon steel liner plate protect and reinforce the body floor. To protect the sloping sides of the body in handling heavier or more abrasive materials (such as iron ore) replaceable side liner plates may be specified. For extremely severe service all liner plates may be of heat treated alloy steel. Three models are available: TP-1114, rated capacity 14 tons; TP-1317, rated capacity 17 tons; TP-1520, rated capacity 20 tons. The trailers can be dumped to either side. The body may be reversed from end to end to prevent excess wear on one side. Easton Car & Construction Co., Dept. RS, Easton, Pa.

For additional information circle number of this item on Readers Service Card.

34

16-S Mixer

A new $1\frac{1}{2}$ -yd. non-tilted is of modern, stream-lined design with advanced features that make for speed and economy has been announced by The T. L. Smith Co. The drum is big in diameter and narrow with extra large drum openings, a wider skip nose and a wider discharge spout. The machine is equipped with 4-cylinder air-cooled gasoline engine, siphon-type water measuring tank and oversize pneumatic tires. It can also be equipped with 4-cylinder radiator-cooled



Smith 16-5 Mixer

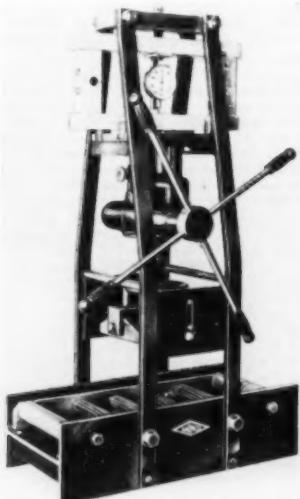
engine or electric motor, if desired. Other features include: Channel section welded supporting frame . . . Universal acting spring suspension . . . Adjustable, shock-absorbing V-belt drive . . . Reduction gears enclosed in oil-tight case . . . Skip vibrator with enclosed operating mechanism . . . Spring stabilizers for charging and mixing cycles . . . Anti-friction bearing equipped, adjustable drum rollers . . . and automotive type steering. The T. L. Smith Co., Dept. RS, 2885 N. 32nd St., Milwaukee 10, Wis.

For additional information circle number of this item on Readers Service Card.

35

Portable Concrete Beam Tester

A portable concrete beam tester for making tests in the field during the construction of concrete pavements is now being made by American Instrument Co., Inc. The machine determines by direct reading, in accordance with ASTM C78 (AASHO T-97) method, the flexural strength of concrete beam specimens having a cross section of 6 in. by 6 in. and sufficient length to permit testing on an 18-in. span. For this cross section and a span of 18 in., one division (1/100) of a revolution of the dial of the strain gage indicates an applied load of 120 lb., corresponding to a flexural strength



Portable Concrete Beam Tester



When Rye Lake in Westchester County, N. Y. receded, cutting off three villages from water supply, the crisis was met by putting dependable Gorman-Rupp pumps to work.



10 INCH PUMP FOR THE BIG JOBS

At a total head of 15 feet this pump will deliver 4150 gallons of water per minute - more than 15 tons of water a minute. This means a torrent of 249,000 gallons per hour.

This great 10 inch self-priming centrifugal is **The Pump for the Big Jobs** -- in construction, open ditch irrigation, water supply and industrial applications.

Wherever there is a large volume of water to handle call on the Gorman-Rupp "Big Boy" the 240-M, 10 inch pump.

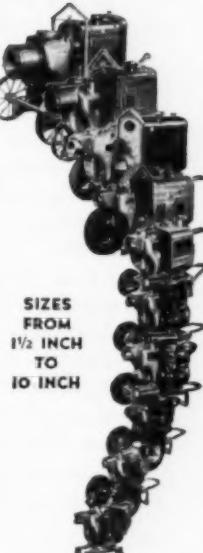
GASOLINE ENGINE DRIVEN

Model 31001, 240M, 10 in. 65 H.P. Length 136" (incl. tongue), width 50", height 65". Net wgt. 2870 lbs. Applicable engines include Hercules Model JXD, and Chrysler Model IND-12.

DIESEL ENGINE DRIVEN

Same as model 31001. Pump performance follows variance of H.P. available on continuous duty operation of different engines. Applicable units include Detroit Diesel 3031 and 3032, International UD-9 and Hercules DOOD.

Write for full information and ask for Bulletin No. 8-CP-11.



SIZES
FROM
1½ INCH
TO
10 INCH





ANOTHER BREAK IN THE DIKE!

Tough words to hear when you're battling a river on a rampage. But that's what happened during the recent disastrous floods on the Fraser River in British Columbia.

Perhaps you don't have to keep "rivers caged up," but that's an important job for Fraser River Pile Driving Co., Ltd. and their experience again proves the unusual mobility and handling ease of MICHIGAN cranes.

Says K. A. Matheson of the above company, "In the City of Mission on the Fraser River, the MICHIGAN cranes did a splendid job owing to their mobility and being able to get from one break in the dikes to another in very short order. In particular the TLDT-20 with remote control was a decided advantage, as it enabled us to do the same work with one less man when labor of this sort was badly needed on other flood-fighting work."

Regardless of your type of work, when you need an excavator-crane... investigate MICHIGAN... you'll agree it's your best buy!

MICHIGAN POWER SHOVEL COMPANY

480 Second Street, Benton Harbor, Michigan, U. S. A.

(modulus of rupture) of 10 lb. per square inch. When the width or the depth of the beam varies from the nominal by more than .05 in., a correction factor corresponding to the actual dimensions must be applied. Maximum capacity: Flexural strength of 1250 lb. per square inch (15,000 lb. load). The tester is separable into three parts weighing 90 lb., 70 lb. and 35 lb. American Instrument Co., Inc., Dept. RS, 8030 Georgia Ave., Silver Spring, Md.

For additional information circle number of this item on Readers Service Card.

36

Aerial Power Saw Carrier

A new aerial power saw carrier, now being manufactured by LeRoy Machine Co., provides a means of hoisting the saw as well as supporting its weight while in use. Whether the operator is aloft a tree or standing on the ground, he works entirely independent of the saw. He may



Aerial Power Saw Carrier

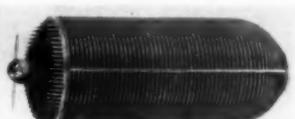
let go of it while he changes position and it hangs free until he is ready for another cut. When cutting, he has only to guide the saw. He can adjust its height in an instant without even stopping his cut. It speeds tree trimming, topping or completely taking down a tree and is easily handled by one man. LeRoy Machine Co., Inc., Dept. RS, LeRoy, N. Y.

For additional information circle number of this item on Readers Service Card.

37

Oil Heat Exchange and Filter

A new oil-heat exchanger and oil-clarifier as a combined integral unit, announced by J. B. Engineering Co., has from both an engineering standpoint and the viewpoint of the operator-owner met with considerable success in preventing many of the undesirable mechanical conditions as are now encountered by the operators of fleets of heavy diesel equipment. The exchanger will be marketed in two sizes which are said to be optimum for the entire diesel field of powered equipment. (A third, and smaller unit will be made available to fleet owners of light automotive equipment.) The unit (the J-B-99 as illustrated) has an O.D. of 10 in. and measures 30 in. in overall length, and is completely finned and is designed to present a surface area of approximately 15 sq. ft. for the dissipation of excessive engine oil heats. The



J-B 99 Heat Exchanger and Filter

unit encompasses a filter cartridge which is unique in design and which is stated to give in excess of 50% greater service than filters of comparable size. J. B. Engineering, Inc., Ltd., Dept. RS, 440 Seaton St., Los Angeles 13, Calif.

For additional information circle number of this item on Readers Service Card.

38

3 Cu. Ft. Mixer

A new 3 cu. ft. capacity Hoe Type Mixer announced by the Construction Machinery Co., Waterloo, Ia., has been primarily designed for inside work right at the point of application. Available with either gas or electric power, the mixer features the exclusive "Triple Hoe Action" found in larger CMC machines.



Hoe-Boy Mixer

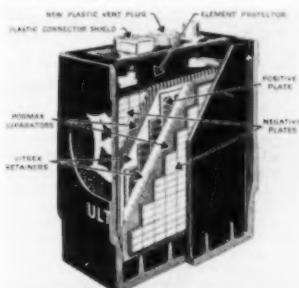
Other features of this new mixer are adjustable, triple-blade mixing hoes, safety grating and bag splitter, self-aligning, self-lubricating shaft bearings, heavy duty electric welded frame, machine cut sprockets and roller chain drive. The mixer is 29 in. wide, with a 36½ in. charging height and 15 in. discharge. Construction Machinery Co., Dept. RS, Glenwood and Vinton, Waterloo, Ia.

For additional information circle number of this item on Readers Service Card.

39

Long Life Automotive Battery

A revolutionary automotive battery, the Exide Ultra Start, has been announced by The Electric Storage Battery Co. Exide engineers estimate that, barring accident or neglect, the Ultra Start should give many more years of dependable service than previous automotive batteries. It will be priced slightly higher than the present line. The Ultra Start's longevity secrets are Silvium, a



Cutaway View of New Exide Ultra Start

HYDRA-LIFT

pulls paving forms faster and cheaper!



"In Pulling Paving Forms, Our New Hydra-Lift Takes the Place of Two or Three Men," says Mr. R. D. (Ray) Davis, Superintendent of the million dollar Kansas City Municipal Airport Project for Perry McGlone Construction Company, Kansas City, Missouri. With 25 years experience in the paving business behind him, Mr. Davis says, "This new Hydra-Lift is the quickest and cheapest way I know of to pull forms!"

Hydra-Lift is the new hydraulic crane that fits on the frame of any truck, 1½ tons or larger. It only needs about 38" behind the truck cab, leaving plenty of room to stack the forms on the bed of the truck. When you're loaded up, just pull the truck ahead and restring the forms.

Hydra-Lift is ideal wherever a light, movable crane can be used. It allows normal use of your truck bed, can run from job to job at normal truck speeds. Capacity is 6,400 pounds; boom swings 180°, lifts through an arc of 100°, telescopes to 22 feet. Installation is easy; cost is much lower than for any comparable unit.

WRITE TODAY FOR FULL DETAILS!

PITMAN MANUFACTURING COMPANY

302 WEST 79TH TERRACE
KANSAS CITY, MISSOURI

for

FASTER BETTER SOIL COMPACTION



Specified densities are quickly reached in granular soils with the Jackson Vibratory Soil Compactor. For those areas adjacent to structures, bridges, culverts, in trenches, factory floors and earth fill dam construction, there is nothing that begins to equal the Jackson Compactor for speed, convenience, and thoroughness of compaction. Self-propelling, the operator merely guides it. Send us a sieve analysis or small sample of the soil, and we will tell you what you can expect in percentage of A.S.S.H.O. densities and depth of compaction.

for

MORE YARDS

JACKSON VIBRATORY EQUIPMENT

OF MUNICIPAL CONCRETE PAVING, HIGHWAY WIDENING,

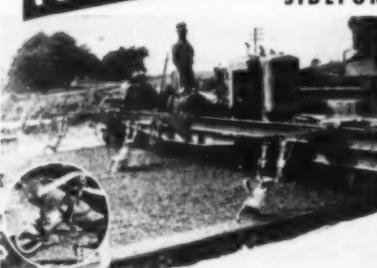
BRIDGE DECKS, ETC.



The Jackson Electric Vibratory Screed strikes off to any crown, undercuts at curb or sideform, works up to and around all obstructions. Permits pouring slab up to 30' without center joint. Requires only two men on widest slab and is the only screed that can be rolled back for second passes on 4 rollers. Powered by Jackson 1.25 KVA Power Plant. Write for details.

for

PERFECT VIBRATION OF CONCRETE AT SIDEFORMS and ELIMINATION OF MANUAL LABOR

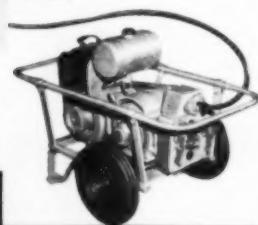


The Jackson Side Form Vibrator mounts on any standard finisher or spreader; employs two or more vibratory units, raised or lowered by finisher operator, which operate close to forms or reinforcement and will ride over any obstruction without fouling. Long-wearing, reliable. Saves better part of 2 men's labor. Write for details.

PORTABLE POWER

Plants of 1.25, 2.5 and 5 KVA to operate all Jackson Vibratory equipment and other tools and lights. Ideal Vibrators for all types of concrete construction FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN



corrosion resisting grid metal made of lead, silver, and other components; a new type high capacity active material; a low specific gravity electrolyte; and the recently announced Formax plastic separator. Still other innovations are said to further enhance its long life, high capacity qualities.

For additional information circle number of this item on Readers Service Card.

40

Bulk Cement Trailer

A new bulk cement trailer, announced by Stewart & Stevenson, Houston, Tex., has a cable dump. There are only three parts to the lifting unit: the 12,000 lb. winch, the cable and the lift arms. The trailer tilts to a 60° angle, and in con-



Cable Dump Bulk Cement Hauler

nection with the 1 in. air vibrator, is stated to permit fast unloading of all the cement without any additional attention. The trailer is available in any size up to 30,000 lb. capacity. Stewart & Stevenson, Dept. RS, 4516 Harrisburg Blvd., Houston 11, Tex.

For additional information circle number of this item on Readers Service Card.

41

Overdrive Added to Roadranger Transmission

Incorporation of overdrive in the latest model of the Fuller 10-speed Roadranger transmission, to add to the flexibility of this "one lever—no gear splitting" innovation, has been announced by the Fuller Manufacturing Co. The addition of overdrive in the Model R-950-C, Fuller adds gear ration of 0.779 to the high range, which incorporates additional ratios ranging from 2.10 to 1.00. The Roadranger provides low range ratios of 7.45 in first to 2.76 in fifth. Reverse gear ratios are 9.89 in the low range; 2.78 in high range. It is built, like the non-overdrive R-95-C, in SAE No. 1 and No. 2 clutch housing sizes. Fuller Manufacturing Co., Dept. RS, Kalamazoo, Mich.

For additional information circle number of this item on Readers Service Card.

42

Device Warns of Engine Trouble

A new warning device (Tellite Signal System) for all types of industrial combustion engines, in production by Rochester Manufacturing Co., Inc., gives three indications of engine trouble: Light off, dim light and flashing light. A dim, visible light glows when all connected units are operating normally. It remains dim when the engine idles. A temperature rise, low oil or air pressure, or any other such condition which would make further engine operation unsafe or detrimental, causes Tellite to flash the warning: Bright-Dim, Bright-Dim. Thus the oper-

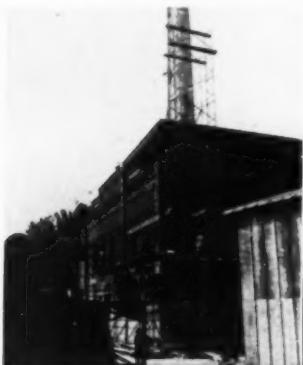
ator is always warned before serious damage is done. Tellite was developed to provide a flashing light signal to warn the driver of a vehicle of any engine malfunction which might result in damage to engine parts. It is a patented, remote indicating, warning system, showing low oil pressure, low air brake pressure, excessive heat rise, generator failure of a partial set of hand brake. Similarly it may be used industrially to indicate abnormally high or low temperature pressure, or electrical current. Rochester Manufacturing Co., Inc., Dept. RS, 87 Rockwood St., Rochester 10, N. Y.

For additional information circle number of this item on Readers Service Card.

43

Material Hoisting Tower

A new Waco material hoisting tower that assembles with standard Waco sectional scaffolding has been announced by the Wilson-Albrecht Co., Inc. The tower, available as either a single or double well unit, can be erected in 2½ hours by three men, and features re-



Waco Single Well Hoisting Tower

mote or pre-set control of platform height, a "slow-up" brake to govern platform descending speed, and a safety slack brake which sets automatically in case of failure in the hoisting mechanism. Powered by interchangeable gasoline or electric units, the tower has a load capacity of 1000 lb. Wilson-Albrecht Co., Inc., Dept. RS, Minneapolis, Minn.

For additional information circle number of this item on Readers Service Card.

44

Masonry Surfaces Water Repellent

A new clear silicone base liquid water repellent, H2-O-NO, for exterior masonry surfaces has been announced by The Chem Industrial Co. The manufacturer advises that one application of this new liquid effectively keeps water out of masonry for periods up to five years. The product is also reputed to repel soot and dirt, minimize efflorescence and reduce spalling. Because it is made with highly penetrating solvents, H2-O-NO is said to enter from 1/16 in. to 3/8 in. into mortar upon application. It then forms a silicone lining for the microscopic masonry pores and waterproofs the pore walls. It does not plug up the pores or prevent transpiration of air. Coverage is esti-

wagner

HYDRAULIC LOADERS

WM3 Hydraulic loader
with material bucket
Patents and
Improvement
Patents applied for.

*unlimited
time & effort
savings*



You save money
when Wagner Loaders
take over your
material handling problems.

LOW INVESTMENT in a Wagner Loader is quickly written off as it pays for itself in more efficient material handling.

BUSY THE YEAR AROUND
Wagner Loaders with 15 interchangeable attachments can be applied to over 50 different material handling problems.

EASY TO USE, the hydraulic double-acting controls put power at your finger-tips for fast precise operation of lifting and operating cylinders.

AND THEY STAY ON THE JOB
Wagner loaders are built to withstand years of hard service. They have many outstanding extras in sturdiness that include: precision built gear type oil pump, heavy combination bumper and radiator grill guard, strong tubular structure.

DECIDE NOW to be one of the 35,000 users benefiting from unlimited time and effort savings with the Wagner Loader.

wagner

TRACTOR LOADER

Please send complete information on

loader for tractor, model

I am interested as user; dealer.

Name _____

Address _____

City _____ State _____

MAIL TODAY

Wagner Iron Works — Dept. 174
1905 S. 1st St., Milwaukee 1, Wis.

mated to range from 100 to 300 sq. ft. per gallon depending upon porosity of masonry on which it is applied. The Chem Industrial Co., Dept. RS, 1114 Hippodrome Bldg., Cleveland 14, O.

For additional information circle number of this item on Readers Service Card.

45

Airport Runways Runway Light

By providing clearer definition of airport runways during foggy or night operation, the new bidirectional high intensity runway light (Type US) available from the Westinghouse Electric Corporation is stated to assure safer instrument landings of aircraft. Besides directing two main beams of light up and down the runway, and light's one-piece 360-degree glass lens provides "off-runway" light for

circling guidance. Available with clear, clear-yellow, or green lenses for runway and threshold markings, the light uses a 200-watt, 6.6 ampere, T-14 bulb, pre-focus base aviation lamp. Color filters are located inside the one-piece lens to eliminate breakage by contact with rain, sleet, or snow. Westinghouse Corporation, Dept. RS, Box 2099, Pittsburgh 30, Pa.

For additional information circle number of this item on Readers Service Card.

46

Pneumatic Concrete Vibrator

A new Thor pneumatic concrete vibrator, designed to compact freshly poured concrete and to direct its movement as it is poured into the form, consists of a $2\frac{1}{2}$ in. diameter steel cylinder $17\frac{1}{2}$ in.

long at the end of a 5-ft. length of combination air and exhaust hose. A ball-bearing rotary air motor and vibrator unit are sealed in the steel cylinder. Features of the new Thor vibrator include an adjustable automatic air line oiler, roll type throttle providing up to 8,000 vibrations per minute and an exclusive steel sleeve around the vibrator unit eliminating possibility of grease loss from bearings. Independent Pneumatic Tool Co., Dept. RS, 175 N. State St., Aurora, Ill.

For additional information circle number of this item on Readers Service Card.

47

Emergency Warning Signal

An emergency warning signal that starts to work instantly when placed upright, requiring no matches or switch, is a product of the Safety Clothing and Equipment Co. The signal has red light flashes on and off signals that can be seen from all directions. The red neon



● During these days of uncertain deliveries, many trucks, bodies and hoists are carrying heavier-than-usual work-loads . . . under conditions that place extra stress and wear on valuable equipment.

More and more, truck owners are benefiting from efficient, dependable—more profitable dumping service . . . through regular maintenance and prompt repair of existing equipment.

Your near-by Marion distributor can furnish genuine Marion parts and factory "know-how" for all of your service and repair requirements.

For the LIFE of your Marion, see your friendly Marion distributor . . . today.



Thor Flare Warning Signal

tube, also available in white, amber, blue and green, is rubber mounted and is shock proof. Lens and lid of sturdy metal case are sealed against dust and moisture. The standard 6-volt battery is quickly and economically replaced. Safety Clothing & Equipment Co., Dept. RS, 7016 Euclid Ave., Cleveland 3, O.

For additional information circle number of this item on Readers Service Card.

48

High Detergency Oil

A new brand—Gulfpride—High Detergency, added to the line of Gulfpride oils of the Gulf Oil Corporation, is the result of three years of research and over 10,000,000 miles of road testing. Gulfpride H.D. oils are manufactured from highest quality 100% paraffinic type crude oils refined by the most modern solvent extraction processes. They also contain oils which have been superrefined by Gulf's exclusive Alchlor Process to remove unstable hydrocarbons which might otherwise form varnish and carbon in the engine as well as detergent-dispersants and other additives. The company claims the new products has remarkable ability to minimize engine deposits, clogged oil rings, sludge forma-

MARIION

MARIION METAL PRODUCTS CO.

Marion, Ohio, U. S. A.

Standard and Special Hoists and Dump Bodies for Heavy-Duty Service

tion, rust and wear in gasoline engines, particularly in "stop-and-go" service.
For additional information circle number of this item on Readers Service Card.

49

Track Jack

A new Simplex single-acting track Jack introduced by Templeton, Kenly & Co., has improved features claimed to speed up and simplify maintenance work on switches and spurs as well as temporary tracks used on construction projects.



Simplex Model 16A Jack

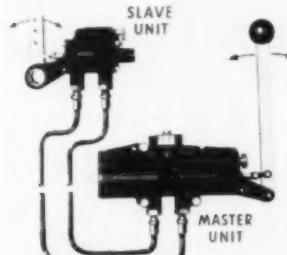
Among these are the very low minimum toe height of only $1\frac{1}{2}$ in. This enables the jack to be placed under rail without removing ballast. The large forged toe (2 $\frac{1}{2}$ in. by 3 $\frac{1}{4}$ in.) stabilizes the load. Templeton, Kenly & Co., Dept. RS, 1020 S. Central Ave., Chicago 44, Ill.

For additional information circle number of this item on Readers Service Card.

50

Remote-Control System

A new hydraulic remote control system, now being offered by Superdraulic Corporation, consists of a master unit and a slave unit interconnected by two small tubes. Motion applied to the actuating lever of the master unit is accurately duplicated by the slave unit lever. It has positive load carrying ability in both directions because its operation is not dependent upon springs, compressed air or valves. A primary feature of this control system provides for expansion and contraction of both fluid and metal due to temperature changes in a manner that guarantees synchronization between master and slave units. An automatic lock in the slave lever provides irre-



Superdraulic Remote Control System

PICK YOUR POWER with

The NEW Acker Teredo Drill...

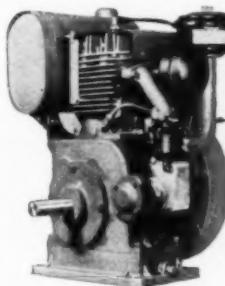
No temperamental prima-donna is Acker's new, versatile Teredo Core Drill—it performs efficiently with any power plant.

And for dependable, low-cost, trouble free operation anywhere in the world—Acker design and construction can't be beat.

See for yourself—write for Bulletin 33, RS



ACKER DRILL CO., INC.
SCRANTON 3, PA.



Four Single-Cylinder WISCONSIN Air-Cooled ENGINES Offering More POWER ADVANTAGE, 6 to 9 hp.

This series of single-cylinder models have all of the traditional Wisconsin heavy-duty features such as self-cleaning tapered roller bearings at both ends of the crankshaft, rotary-type, high tension OUTSIDE magneto operating as an independent unit, and maximum torque at all usable speeds.

CONDENSED SPECIFICATIONS

MODELS	AEH	AFH	AGH	AHH
Bore - - - - - inches	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{8}$
Stroke - - - - - inches	3 $\frac{1}{4}$	4	4	4
Disp. cubic inches - - - - -	23	33.2	38.5	41.3
H. P. and R.P.M. range - - - - -	3.9 at 1600	6.0 at 1600	7.2 at 1600	7.7 at 1600
	6.1 at 2600	7.2 at 2600	8.4 at 2600	9.2 at 2600
Net weight in lbs., Standard Engine - - -	130	180	180	180

Our engineering department will gladly cooperate with you in adapting Wisconsin Engines to your requirements. Write for detailed data and name of the nearest Wisconsin distributor.



FLEET OWNERSHIP SPEAKS FOR ITSELF



THE EAGLE TRUCK-MOUNTED LOADER ...

Makes fast work of loading any loose material—dirt, cinders, snow, etc. Gets from job to job at truck speed. One man operated! Their record of economical performance leads to fleet purchase. Send for Form 947-109.



*You're better prepared
WITH GLEDHILL SNOW PLOWS!*



One way plow—crimped blade means much better rotation—sturdy, balanced design.



V-Plow—extra heavy construction, interchangeability, direct lift. (Choice of 22 models.)

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

versibility. This control system eliminates bell cranks, rods, linkage, cables, gears, sprockets and chains. The Superdraulic remote control, although small and compact, is capable of handling 500-inch pounds of torque. Other sizes will be available soon. Superdraulic Corporation, Dept. RS, 14256 Wyoming Ave., Detroit 4, Mich.

For additional information circle number of this item on Readers Service Card.

51

Concrete Beam Tester

A new machine, announced by American Instrument Co., determines by direct reading, the flexural strength of concrete-beam specimens having a cross-section of 6 x 6 in. and sufficient length to permit testing on a 18-in. span, according to A.S.T.M. C78 or A.A.S.H.O. T-97. One division (one one-hundredth of a revolution) on the dial of the gage indicates an applied load of 120 lb., which corresponds to a flexural strength (modulus of rupture) of 10 psi. When the width or depth of the specimen beam varies from the nominal (6 x 6 in.) by more than 0.05 in., a correction factor must be applied. Correction factors for widths and spans varying from 5.75 to 6.25 in. are given in the instruction manual which is supplied with each machine. The machine has a maximum flexural-strength capacity of 1250 psi. (15,000-lb. load). The machine weighs 195 lb. American Instrument Co., Inc., Dept. RS, 8030 Georgia Ave., Silver Spring, Md.

For additional information circle above number on Readers Service Card.

52

Nail Cutting Saw Blade

A new nail cutting saw blade for portable saw, announced by Carbide Saw & Tool Co., is stated to cut (by milling action) with ease through corrugated asbestos-cement board, many other abrasive building materials, dirty form lumber, wire reinforced wall boards, and flooring containing common nails. Recent demonstrations were made cutting over 50 common ten penny nails in 2 x 8 hard maple followed by repeated passes through hard maple (to test the smoothness of cut) and then cutting 20 ft. of corrugated Transite across the corrugations without damage to the saw blade or any appreciable loss in cutting efficiency. Carbide Saw & Tool Co., Dept. RS, 327 South LaSalle St., Chicago 4, Ill.

For additional information circle above number on Readers Service Card.

MANUFACTURERS' LITERATURE

53

Soil Testing Apparatus

In keeping with its expressed intention of being able to supply the complete needs of the modern soils laboratory, Soil Testing Services, Inc., has issued a 12-page illustrated, descriptive catalog of equipment which is not included in their current, illustrated brochure. In addition, the catalog specifically mentions other items and groups of available items. Among the most generally used equipment included in the new catalog is

the Soiltest frame mounted, electric loading triaxial apparatus. Another Soiltest consolidation apparatus illustrated and described in detail is a high capacity, structural steel consolidation loading frame and is designed to apply a maximum pressure of approximately 52 tons per sq. ft. on a standard 100 sq. cm. specimen, but can be used for all types of consolidometers. Another popular piece of equipment is California bearing ratio apparatus for laboratory or field work. Other items include dispersion mixers, classification sets, the Terzaghi water level for differential settlement observations and the Harvard miniature compaction apparatus. Soil Testing Services, Inc., Dept. RS, 4520 West North Ave., Chicago 39, Ill.

54

Hose Lines and Couplings

A 42-page catalog on its products has been issued by Aerquip Corporation. Descriptions and illustration of its hose lines and self-sealing couplings are given. In addition to giving complete information about Aerquip industrial products, the catalog contains information on how to order Aerquip parts and the construction and principles of Aerquip hose lines and detachable, reusable fittings. Aerquip Corporation, Dept. RS, Jackson, Mich.

55

Motor Graders

A 24-page two-color catalog presenting Allis-Chalmers AD-4 104 hp. and AD-3 78 hp. motor graders has been released by the company's Tractor Division. The AD-4 largest of the five models of motor graders built by Allis-Chalmers is shown

on the cover. Many action pictures illustrate the advantages and usefulness of this large equipment. Attention is given to the outstanding rigid design of this line of motor graders and their ability to handle the job. The many plus features are described in detail and cutaway views provide close up inspection of the power supply, transmission and final drive. Allis-Chalmers Manufacturing Co., Tractor Division, Dept. RS, Box 512, Milwaukee 1, Wis.

56

Crushing, Screening, Washing Equipment

A new 4-page bulletin featuring the Diamond line of aggregate crushing, screening and washing equipment is available. The bulletin covers basic production units as well as portable and stationary crushing plants and portable primary crushing plants. Descriptions, sizes and illustrations of the units are included. Diamond Iron Works, Inc., Dept. RS, Minneapolis 11, Minn.

57

Material Testing Apparatus

A suggested list of apparatus for laboratory tests of concrete and bituminous materials for road and airport construction has been compiled by Central Scientific Co. Copies will be sent free on request to construction engineers. Ask for list No. 2001. Central Scientific Co., Dept. RS, 1700 W. Irving Park, Chicago, Ill.

58

Winch Manual

A 12-page operator's guide and general instructions for the Hyster D7N towing

COMMENT

from the

BUTLER ENGINEER

August, 1951

Alas, Alack, Eheu and Dammit!

Long ago (but still within the memory of some of us who have since grown prematurely old and gray)—a manufacturer could plan production schedules, order his materials and in turn give firm delivery dates to his customers.

Sounds like a fairy tale—but, honest injun, it's the truth!

But for darn sure it's no fairy tale we're living in today. It's a ring-tailed, oscillating, first-class nightmare. Give a look: Vastly increased orders versus drastically cut steel supplies. Steel quotas for civilian use *slashed to 9% of mill production* . . . Moreover, we're legally required to fill defense orders up to 25% of our own production and, law or no law, every patriotic manufacturer feels it his duty voluntarily to accept that condition.

We even tried a crystal ball to find an answer, but the future was so chaotically confused the c.b. screamed horribly and burst into a thousand fragments.

Lord knows we're desperately trying to keep our customers happy. And our suppliers are doing their best for us, too.

But you and I and all of us are in the same boat (the good ship ULCER)—so let's not rock it.

I was talking with a brigadier general just recently returned from Korea. Upon his arrival in that devastated land he had met a bruised, battered and bandaged sergeant in the French Foreign Legion. "What's it like here in Korea?" asked my friend.

"Sir, zis is ze hell of a war—jus' hell!" Then, with great earnestness, "But better zan no war at all."

The Butler Engineer

BUTLER BIN COMPANY
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AL SCHWARTZ Managing Director

A LAWRENCE PRINCE Resident Manager

Quick Help on Product Information

1. For latest information on any product you need in roadbuilding, earth moving, heavy construction, etc., use business-reply card inserted in this publication. Just fill in our code numbers on blank lines of Part "C" of the postcard, fill in name, address, etc., tear out, and mail.

2. For information on particular products advertised in this issue, use Part "A" of the bound-in cards.

3. Part "B" of the cards is also usable for further information on any items described in the "New Equipment and Materials" or "Manufacturers Literature" sections of the magazine.

A		B		C		D		E		F		G		H		I		J		K		L		M		N		O		P	
7201	Acetylene Gas	2002	Cement, Asphaltic	6204	Engines, Distillate	1803	Kettles, Bituminous																								
2001	Additives, Bituminous	3002	Cement, Portland	6205	Engines, Gasoline																										
7001	Agitator Bodies, Truck	3003	Cement, Quick-Setting	6602	Excavators, Slackline																										
6201	Air Cleaners	3205	Cement, White																												
1001	Air Compressors		Centering, Concrete Arch																												
1002	Air Comp., Self-Propelled	3005	Center Strip Materials, Road	3009	Fabric, Welded Wire	4403	Lanterns																								
3018	Air Entraining Agents	7401	Chain	1211	Feeders, Aggregate	5803	Leaf-Collecting Machines																								
1003	Air Tool Accessories	7401	Chain, Conveyor	2006	Felt, Subgrade (Elastic)	4404	Lights, Acetylene																								
3201	Anchor Rods (Bridge)	1206	Chutes, Concrete and Dry Material	7402	Fencing, Wire	4402	Lights, Flood																								
3202	Arches, Corrugated Metal	2811	Clearing Equipment, Tractor-Mounted	4201	Filing Systems	4405	Lights, Flood (for Equipment)																								
2002	Asphalt Cement	6406	Cleaning Solvents	1809	Finegraders (Subgraders)	4406	Lights, Warning (Electric)																								
2003	Asphalt, Emulsion	6406	Cleaners, Cement Bag	2606	Finishers (Pavers), Bituminous	7608	Liner Plates, Tunnel																								
2004	Asphalt, Liquid	3601	Compactors, Soil	2607	Finishers, Vibrating	7609	Linings, Brake and Clutch																								
2005	Asphalt, Powdered	3601	Control Equipment, Hydraulic	2811	Finishing Machines, Concrete	2202	Lips, Bucket																								
7002	Axes, Truck	2602	Concrete Cutting Machines	5201	Fittings, Wire Rope	5402	Loaders, Elevating, Belt Type																								
		2618	Concrete Placers	4401	Flares (Torches)	5401	Loaders, Bucket																								
6801	Backfillers	2603	Connectors, Timber	4005	Fluid, Hydraulic	5403	Loaders, Front-End																								
1604	Backfill Tamers	3206	Contraction Plates	5802	Flushers, Street	5404	Loaders, Truck-Mounted																								
1401	Batchers, Agg. & Cement	3006	Control Equip., Cable	2007	Flux, Asphalt	3605	Lubricants																								
3602	Batchers, Cement	5405	Crawler Tracks	7007	Fork Trucks	3606	Lubricants, Compressor and Air Tool																								
2801	Batchers, Water	4004	Cranes, Crawler-Mounted	2815	Forms, Catch Basin and Manhole (Concrete)	3607	Lubricants, Diesel Engine																								
6202	Batteries, Elec. Storage	1205	Cranes, Cranes, Crawler-Mounted	2815	Forms, Concrete Construction	3608	Lubricants, Grease and Oil (Engine)																								
4601	Beads, Glass Reflecting	1205	Cranes, Tractor-Mounted	2817	Forms, Curb, Road and Sidewalk (Concrete)	3609	Lubricants, Wire Rope																								
7601	Bearings, Roller	4802	Crawlers, Truck-Mounted	3603	Fuel, Diesel and Gasoline																										
6001	Belting, Conveyor	4803	Cribbing, Retaining Wall	3212	Gates, Drainage	4809	Magnets, Lifting																								
2804	Belts, Concrete-Finishing	6407	Crushers, Gyrotary	1214	Generator Sets, Engine	3805	Maintainers, Pull-Type																								
2805	Benders, Bar	4804	Crushers, Jaw	1810	Generators, Steam	3804	Maintainers, Under-Tractor																								
2806	Bins and Hoppers	4805	Crushers, Roll	3801	Graders, Elevating	3806	Maintainers, Under-Truck																								
1007	Bits, Drill: Sharpeners	4806	Cranes, Wheel-Mounted	3803	Graders, Motor	7610	Melting Pots, Lead																								
1005	Bits, Rock Drill	6408	Crawler Tracks	3802	Graders, Pull-Type	1811	Mills, Grinding (Asphalt)																								
2201	Blades, Grader, Loader and Scraper	1207	Culvert Cleaning Tools	3804	Graphite	1817	Mixers, Bituminous																								
5601	Blades, Toothed (Ice Removal)	1207	Culverts, Corrug. Metal	2009	Grapples	2610	Mixers, Concrete																								
6601	Block and Tackle	3207	Culverts, Sectional Plate	3405	Grinders, Concrete-Surf.	2611	Mixers, Mortar and Plaster																								
2601	Block Machines, Concrete	3208	Curb and Gutter Machine	1212	Grizzlies	3807	Mowers, Highway																								
3203	Boat Spikes & Drift Pins	2618	Curing Machines, Concrete (Spray)	3213	Guard Rails	2612	Mud Jacks																								
7001	Bodies, Agitating	2604	Curing Materials, Concrete																												
7003	Bodies, Dump	3007	Cutters, Bar and Rod																												
7004	Bodies, Flatbed	3007	Cylinders, Hydraulic																												
7005	Bodies, Garbage Col.																														
7006	Bodies, Pick-up	2813																													
7002	Booms, Special	4001																													
1203	Breakers, Impact																														
1006	Breakers, Pavement																														
2807	Bridges, Float																														
3204	Bridges, Suspension	3210	Decking, Bridge (Open and Solid)	1814	Heaters, Tank Car (Bituminous)																										
1806	Brooms, Drag	7606	Derricks	1815	Heaters, Tool (Bitum.)																										
1807	Brooms, Road	2408	Dippers, Shovel	1816	Heaters, Torch	5003	Packing, Pump and Valve																								
2401	Buckets, Cableway	1802	Distributors, Bituminous	2819	Heaters, Water	4605	Paints, Priming																								
2402	Buckets, Clamshell	3008	Dowels and Assemblies	7607	Hoists, Electric	4603	Paints, Rust-Preventive																								
2403	Buckets, Clamshell (Hydraulic)	4807	Draglines, Walking	4003	Hoses, Hand	4604	Paint Sprayers and Compressors																								
2404	Buckets, Concrete	1215	Drags, Sand	4002	Hoists, Hydraulic (Body)	4608	Paints, Traffic line																								
2405	Buckets, Dragline	5002	Dredges and Dredging Mch.	1012	Hoists, Pneumatic	4606	Paints, Traffic Line Marking (Reflecting)																								
2406	Buckets, Dredge			4808	Hoists, Power Drum																										
2808	Buggies and Carts, Conc.	1201	Driers, Aggregate	6002	Hose, Air	2613	Pavers, Concrete																								
7604	Buildings, Demountable	3401	Drills, Cable Tool (Well)	6003	Hose, Cement-Handling	3214	Pile Drivers																								
6405	Bulldozers	3402	Drills, Core	6004	Hose, Couplings	3221	Pile Hammers																								
6401	Bulldozers, Angling	3403	Drills, Earth-Boring	6005	Hose, Metal (Flexible)	3216	Piling, Bridge and Found.																								
6404	Bulldozers for Motor Graders	1016	Drills, Electric	6006	Hose, Suction	3215	Piling, Steel-Sheet																								
		3404	Drills, Electric Hammer	6007	Hose, Water	3211	Pipe, Drainage (Perf.)																								
		1009	Drills, Rock (Hand-Held)	1006	Jacks, Hydraulic	3217	Pipe, Dredge																								
		1010	Drills, Rock (Tripod)	2608	Joint-Cleaning Machines	3208	Pipe-Joint Materials																								
		1011	Drills, Rock (Wagon)	2609	Joint Installing Machines	2008	Plank, Asphalt																								
				3010	Joint Plates, Base (Waterproof)	1818	Plants, Asphalt (Emulsified)																								
				3011	Joint-Sealing Compounds	2802	Plants, Batching (Conc.)																								
				3012	Joints, Pavement	2803	Plants, Batching (Low-Bin, Portable)																								

(List continued on opposite page)

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B If you want more facts about any of the new equipment or the trade literature described in this issue, circle the proper numbers in section B of the card.

C If you want catalogs for any of the products listed on the two pages next to this card, enter the proper product names or numbers in section C of the card.

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8-51-R5

Information about the products advertised on:

Page..... by..... Page..... by.....
A Page..... by..... Page..... by.....
 Page..... by..... Page..... by.....

More new equipment information or trade literature on items circled:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
B	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	

Catalogs describing the following products listed on opposite and following right-hand pages:

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
B	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	

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Page..... by..... Page..... by.....
A Page..... by..... Page..... by.....
 Page..... by..... Page..... by.....

More new equipment information or trade literature on items circled:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
B	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	

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On the reverse side of this sheet is an opportunity for you to get quickly, efficiently and economically all the information you may need about:

A Products advertised in this issue of Roads and Streets,

B New equipment described in it or new trade literature mentioned, or

C Any other products—machinery, equipment, materials or supplies—that may interest you. A suggestive list—specially compiled and arranged for your convenience—appears on the two pages adjacent to this card. Consult it.

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Quick Help on Product Information

1604	Plants Bituminous (Portable)	R	2411	Skullcrackers	3410	Tools, Mechanics' (Construction and Equip.)	
1601	Plants, Bituminous (Stationary)	3808	Rake Attachments for Graders	5602	Snow Fencing	2822	Towers, Material-Hoisting
1603	Plants, Bitum. Travel	6008	Reels, Hose	5603	Snow Loaders	7613	Track, Industrial-Railway
2809	Plants, Cement (Bulk; Portable)	3014	Reinforcing Bar Accessories	5604	Snow Plows, Blade and V-Type	6208	Tractors, Crawler
2812	Plants, Concrete-Mixing (Portable)	2203	Rippers and Rooters	5606	Snow Plows, Rotary (for Motor Graders)	6209	Tractors, Wheel
2810	Plants, Concrete-Mixing (Stationary)	1014	Riveters and Chippers, Pneumatic	5607	Snow Plows, Sidewalk	4609	Traffic Line Marking Machines
		5206	Rollers, Single Drum	4202	Soil Sampling and Testing Sets	6603	Trailers, Flatbed
1208	Plants, Crushing and Screening (Portable)	1801	Rollers, Grid-Type	5208	Soil-Stabilizing Eqpt.	6604	Trailers, Tilting
1209	Plants, Crushing and Screening (Stationary)	5202	Rollers, Pneumatic-Tired	1820	Spray Bar, Bituminous	6605	Tramways, Aerial
5405	Power Control Units	5204	Rollers, Tandem	1805	Sprayers, Bit, Hand	6802	Trenching Machines
5004	Power Plants, Portable	5203	Rollers, Sheepfoot	2615	Spreaders, Concrete	2616	Truck Mixers
7008	Power Take-Offs, Truck	5205	Rollers, 3-Wheel	1404	Spreaders, Dry Material	7011	Trucks, Motor
6206	Power Units	5207	Rollers, Trench	5805	Sprinklers, Street	7007	Trucks, Industrial (Fork)
3218	Preservatives, Wood	2010	Rubber Road Materials	2412	Steel, Alloy	7012	Trucks, Off-the-Highway
3406	Presses, Crawler Track Pin	6207	Rust Preventives, Engine	3015	Steel, Concrete-Reinforced	7614	Tubing, Steel (Seamless)
		2820	Salamanders	1008	Steel, Drill	U	
4801	Pull Shovels (Backhoes)	1804	Sandals, Bitum. Paving	7404	Steel, Structural	3220	Underpasses, Pedestrain and Livestock
6403	Pull Shovels, Tractor-Mounted	4607	Sand Blasters	4203	Surveying Instruments	V	
6402	Pull Shovels, Trailing, 2-Wheel	3409	Saw Rigs	5804	Sweepers, Street		
1213	Pulverizers, Hammer	3407	Saws, Chain			T	
5005	Pumps, Bituminous	1402	Scales, Weigh-Butcher	4812	Tagline Controls	4007	Valves, Hydraulic
5014	Pumps, Centrifugal (Portable)	1403	Scales, Wheelbarrow	7010	Tail Gates, Elevating	1015	Valves, Safety (Air-Line)
5006	Pumps, Centrifugal (Stationary)	5407	Scrapers, Drawn	1819	Tanks, Relay and Storage (Bituminous)	2817	Vibrators, Concrete
5007	Pumps, Diaphragm	5406	Scrapers, Self-Propelled	7612	Tarpaulins	W	
5008	Pumps, Displacement	2204	Screeds, Concrete	2009	Tar, Road	5408	Wagons, Dump
5009	Pumps, Dredge	2821	Screeders, Vibrating	2205	Teeth, Bucket, Ripper, Scarifier, etc.	1217	Washers and Scrubbers, Aggregate
5010	Pumps, Gear	3206	Screens, Vibrating	3016	Tie Rods	4610	Waterproofing Compounds
5011	Pumps, Grease and Oil	4810	Scythes, Power	7615	Timber Construction, Laminated	7203	Welding Apparatus
5012	Pumps, Hydraulic	6409	Shovels, Crawler-Mounted	6008	Tires, Construction Equipment	7204	Welding Rods
5013	Pumps, Jetting	7009	Shovels, Tractor-Mounted	6010	Tires, Truck	3411	Wheelbarrows, Power
5016	Pumps, Pneumatic	7615	Sign Painting Eqpt.	3409	Tool Carts	2413	Wheels, Steel
5015	Pumps, Rotary	7611	Signs, Road	1812	Tools, Hand (Bituminous)	3810	Wideners, Highway
		4811	Skimmers	2818	Tools, Hand (Concrete)	4008	Winches
						3017	Wire, Form and Tie
						3009	Wire Mesh, Pavement
						7405	Wire Rope

winch designed exclusively for the Caterpillar D7 diesel tractor is available. The winch manual is designed to show the operator how to obtain maximum performance and full utility of the winch. In four sections, the guide describes mechanical components of the winch, fundamentals and advanced operating instruction, typical winch operations and rigging methods, a summary of efficiency reminders, and glossary of winching terms. Hyster Co., Dept. RS, 2902 N.E. Clackamas St., Portland 8, Ore.

59

Gravel Plants

Literature featuring a new single pass county gravel plant has been announced by Diamond Iron Works. Three plants with a capacity range from 20 to 65 tons per hour are included in the bulletin, called CP-1. A complete description of its applicability plus the basic units comprising the plant, the outstanding features and full specifications, are covered. Diamond Iron Works, Inc., Dept. RS, Minneapolis 11, Minn.

60

Dragline Buckets

All five types of Esco dragline buckets are illustrated in a new catalog. Described are the Featherweight, Medium Weight, Heavy Duty (Standard), Extra Heavy Duty (Under Water Mining) and

Stripping dragline buckets. Specifications are given in easy to read detail and are illustrated with a model view of the representative bucket. Recommendations are given with each set of specifications. Electric Steel Foundry Co., Dept. RS, 2141 N. W. 25th Ave., Portland 10, Ore.

61

Slackline Cableway Excavator

A 28-page catalog tells where to use, when to use and cost of using the slackline cableway excavator which digs, conveys, elevates and automatically dumps materials, all in one motion. Explains graphically the particular advantages of this machine for digging in marshes, bogs and under water. Over 100 photographs and sketches of machines at work in gravel pits, clay pits, open pit mines, digging reservoirs, making earth dams, reclaiming waste piles, cleaning out ponds, etc. New rapid shifter device described; also new tubular steel masts and machines with movable towers. Saueran Bros., Inc., Dept. RS, 522 S. Clinton St., Chicago 7, Ill.

62

Diesel Engines

Four two-page folders presenting operating and construction features of International diesel engines are being distributed by the International Harvester Co. These folders offer detailed infor-

mation on reserve torque control, all-weather gasoline conversion starting, combustion control, and long-life lubrication. The titles and form numbers of these folders are: Long-Life Lubrication, CR-131-A; Combustion Control for Economical Power, CR-132-A; Fast All-Weather Starts, CR-130-A; and Pull Through Overloads, CR-133-A. Industrial Power Division, International Harvester Co., Dept. RS, 180 North Michigan Ave., Chicago 1, Ill.

63

Calcium Chloride for Unpaved Roads

The proper procedure for using calcium chloride on unpaved roads is described in a recent bulletin of the Calcium Chloride Association. The bulletin describes the calcium chloride treated road, points out the advantages of calcium chloride maintenance, and tells how to use calcium chloride. The use of calcium chloride for spring, summer and fall maintenance is also described. Calcium Chloride Association, Dept. RS, Ring Bldg., Washington 6, D. C.

64

Correcting Bad Floor Conditions

A new pocket-size 32-page booklet, issued by Stonhard Co., tells where to look

BLADES AND CUTTING EDGES of Superior Quality by Shunk



Shunk
MANUFACTURING
COMPANY
Established 1859
BUCKRUS, OHIO.

VULCAN PAVEMENT AND
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hammers.

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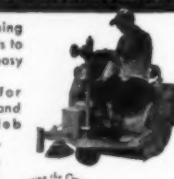
Wilshire POWER SWEEPER

Picks up everything
from cigarette butts to
pop bottles in one easy
operation!

Write today for
dealer nearest you and
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Wilshire
POWER SWEEPER CO.
125 W. Elmer Chase Drive
Glendale 4, Calif.



Sweeping the Country
SINCE 1940

for and how to correct bad floor conditions. It tells how to protect both concrete and wood floorings and maintain proper repair by comparatively unskilled workmen. Stonhard Co., Dept. RS, 525 Stonhard Bldg., 1306 Spring Garden St., Philadelphia, Pa.

65

Low Pressure Pipe Coupling

A new folder illustrating and describing the Naylor low-pressure wedge-lock coupling is available. Designed for connecting light-weight pipe in ventilating and similar low-pressure service, this one-piece positive type coupling features speed and simplicity of installation, it is stated. Included in data are complete specifications on pipe sizes from 8 in. to 30 in. in diameter. Naylor Pipe Co., Dept. RS, 1230 East 92nd St., Chicago 19, Ill.

66

Mastic Floor Underlays

A new 4-page folder on mastic flooring underlays, including both asphalt and mastic types has been issued by the Industrial Products Division of Flintkote Co. The composition and mixtures for asphalt emulsion and rubber latex binders are described together with recommended practice in application. The Flintkote Co., Inc., Dept. RS, 30 Rockefeller Plaza, New York 20, N. Y.

67

Stone and Bituminous Spreaders

Two circulars covering its stone and bituminous spreaders are available from I. J. Overman Mfg. Co. This is a low-cost spreader-paver that lays stone, gravel, shale base and hot or cold asphalt mix. Specifications for three models are included. One circular is devoted to instructions for using the machine. I. J. Overman Mfg. Co., Dept. RS, 3301 South Torrance St., Marion, Ind.

68

Truck Crane

A bulletin on its Hopto TM truck crane is available from Badger Machine Co. This machine is designed for operation without the use of drums, clutches, brakes, etc. The crane fits all trucks, 1½ ton or larger. It has a hydraulically-operated take-off or independent motor. The machine has quick change attachments that make it available for trenching and shovel work. Badger Machine Co., Dept. RS, Winona, Minn.

69

Gravel Plant

Literature featuring a new single pass county gravel plant has been announced by Diamond Iron Work, Inc. Three plants with a capacity range from 20 to 65 tons per hour are included in the bulletin, called CP-1. A complete description of its applicability plus the basic units comprising the plant, the outstanding features and full specifications, are covered. Diamond Iron Work, Inc., Dept. RS, 18th Ave., North and 2nd St., Minneapolis 11, Minn.

70

Asphalt Paving Plants

The recently developed SM series asphalt paving plant line is covered in two new 4-page bulletins of Standard Steel Corporation. One bulletin is devoted mainly to operators' experience with the

equipment in the field and the second deals with construction details of the plants which are available in batch capacities from 500 to 6000 lb. New structural improvements described and illustrated include individualized drives, easy one-man operation, sectionalized mixer linings and modern vertical streamlined design. Standard Steel Corporation, Dept. RS, 5001 S. Boyle Ave., Los Angeles 58, Calif.

71

Lift Gate for Trucks

A low-cost, hydraulically operated lift-gate that eliminates the physical labor of lifting loads on or off a truck platform is the subject of a new illustrated folder announced by Hercules Steel Products Corporation. The Hercules Load-N-Gate described in the folder is stated to have sufficient capacity for practically every type of service, and is available in four sizes, and is easy to install. The platform may be "locked" at any desired height to facilitate efficient loading or unloading. Hercules Steel Products Corporation, Dept. RS, Galion, O.

72

3-5 Ton Tandem Roller

A catalog on its new model 3-5 ton variable weight tandem roller is available from Galion Iron Works & Mfg. Co. The many improvements in construction and operation are fully described and illustrated. Among the new features are hydraulic steering, spur-gear final drive with machine-cut alloy steel gears, constant-mesh transmission, and a pneumatic-tired towing attachment (available as an extra). Complete specifications are also listed. Galion Iron Works & Mfg. Co., Dept. RS, Galion, O.

73

Circuit Breaker Panelboards

A new 20-page booklet describing circuit breaker panelboards for the control and protection of lighting, appliances, and many other power applications—and the circuits that supply them—is available from Westinghouse Electric Corporation. The booklet describes the Westinghouse line of De-Ion circuit breakers for a complete range of industrial and commercial requirements, in capacities from 10 to 600 amperes. Westinghouse Electric Corporation, Dept. RS, Box 2099, Pittsburgh 30, Pa.

74

Spur Gear Drive

A two-page illustrated specification sheet gives comprehensive data on the Atlas double reduction spur gear drive. The bulletin covers application of the drive for use in Atlas locomotives for tunnel driving coal and metal mining, and intra-plant use. Atlas Car & Manufacturing Co., Dept. RS, 1100 Ivanhoe Road, Cleveland, O.

75

"National Security Rides on Trucks"

A 2-color, 8-page booklet, entitled "National Security Rides on Trucks" has been released by Mack Trucks, Inc. This booklet is designed to meet the needs of educators, commentators, editors, group leaders, etc., by giving them a factual and dramatic highlight summary of the importance of the trucking industry to the country's economy. The booklet in-

cludes quotations from high military and government officials as to the vital necessity of trucking, cites the results of special surveys into civilian defense and defense economy needs, and gives valuable examples of the growth of the trucking industry. The booklet emphasizes a three-point program: High priority for the needs of our essential roads, Abolition of obsolete and conflicting state road restrictions. Full use of highway taxes for better highways. Trucking Information Service, Mack Trucks, Inc., Dept. RS, 350 Fifth Ave., New York 1, N. Y.

76

Air Entrained Concrete

"What Air Entrainment Means to You," is the name of a new leaflet which gives the boiled-down facts about the advantages of air entrainment in concrete. Bumperette Division, Maxon Construction Co., Inc., Dept. RS, 131 North Ludlow St., Dayton, 2, O.

77

Clay Products

A condensed four-page bulletin published by The Robinson Clay Products Co. details and illustrates the broad range of clay products made by Robinson. Condensed specifications are provided for Robinson vitrified clay pipe, perforated clay pipe, "Skip-Pipe," Staminite Pipe, clay liner plates, clay flue lining, chimney tops and bases, vitrified clay

meter boxes, Lap-Lok wall coping and septic tanks with burned-in baffles. A. E. Williams, Dept. RS, The Robinson Clay Product Co., Akron, O.

78

Arc Welders

Literature issued by Miller Electric Manufacturing Co. describes complete line of transformer type welder for all applications of the "Heliare" process. Included are charts, specifications and recommendations for automatic control panels, and "Heliare" spot welder. Miller Electric Manufacturing Co., Dept. RS, Appleton, Wis.

79

Lubricants

A new folder on D-A lubricants for heavy-duty construction equipment is available from D-A Lubricants Co., Inc. The folder tells what the lubricant is and what it does in the way of giving additional protection to gears, in reducing lubricant consumption and in resisting sludge formation in severe conditions. D-A Lubricant Co., Inc., Dept. RS, 1311 W. 29th St., Indianapolis 23, Ind.

80

Heavy-Duty Air Cooled Engines

An 8-page catalog featuring its heavy-duty air-cooled engines has been issued by Wisconsin Motors Corporation. The

versatility of these engines is shown in numerous illustrations. Single cylinder engines, 3 to 9 hp., are illustrated and described and specifications are given. The 2- and 4-cylinder engines, 7 to 30 hp. also are covered. Power curves and dimensions for the various models are included. Wisconsin Motors Corporation, Dept. RS, Milwaukee 46, Wis.

81

Rubber Products for Construction Industry

A useful catalog on rubber products for the construction industry has been issued by Continental Rubber Works. Everything from boots to pump diaphragms, is covered in it. Contractors will find this a worth-while reference for products they use in their work. Among the products illustrated and described are: Three types of airhose, multi-purpose hose, three types of water hose, jet hose for use on dredges, sand suckers and pile driving rigs, two types of discharge hose for centrifugal and diaphragm pumps, pile driving hose, four types of steam hose, three types of water suction hose, sand suction hose, dredge sand suction hose, sand blast hose, tank truck hose, and industrial rubber footwear. Sections of the catalog are devoted to hose connections and fittings, and to Punch-Lok hose clamps, tools and fittings. Continental Rubber Works, Dept. RS, Erie, Pa.

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1—Insley Model K12 comb. ½ cu. yd. drag and backhoe machine. Rebuilt 60 days ago at cost of \$2,500. Set of floats, 35 ft. of boom, Fairleads, tagline, complete. Year 1946. Buda Engine #248-885; Serial #141. H.P. 100. S/N 9513C. Working now. Excellent condition. Sale price: \$39,000.00 f.o.b. Chicago, Illinois.

1—Insley Model K12 comb. ½ cu. yd. drag and backhoe machine. Rebuilt 60 days ago at cost of \$2,500. Set of floats, 35 ft. of boom, Fairleads, tagline, complete. Year 1946. Buda Engine #248-885; Serial #141. H.P. 100. S/N 9513C. Working now. Excellent condition. Sale price: \$39,000.00 f.o.b. Chicago, Illinois.

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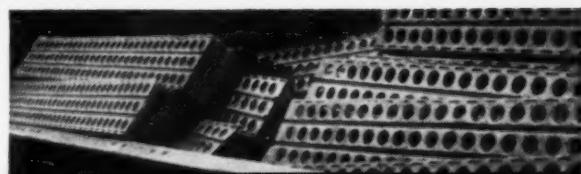
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125 Shoreham Road Massapequa, L.I., N.Y.

FOR SALE

- 2 Trojan Loaders—New—Bargain Price
- 1 1/2 Yard Little Giant upper, with combination shovel and backhoe—New—Real Bargain Price.
- 1 Schramm, 105 Diesel Compressor, on Wheels, like new.

Buffalo Gravel Corp.

111 Great Arrow Ave., Buffalo 16, N.Y.
TELEPHONE RR 6800



For Immediate Delivery!

700 GROSS TONS USED STEEL LANDING MAT

PIERCED PLANK TYPE
10' x 15" — 10 gauge

Suitable for landing fields—temporary roadways
concrete reinforcing—fencing

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DULIEN STEEL  **PRODUCTS, Inc.**

of Washington

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SEVEN MACK TRUCKS SURPLUS CHASSIS

Mack's 10 Wheelers—6x6, 707 thermodyne engine, double driving rear's (Timken 353) 1000x22 tires, bad wheels, all open top cabs

Suitable for
Truck Tractors, Concrete Mixers, Dumpers,
Crane and Shovel Mountings.

ALL STATE TRUCK & TRAILER

58th Street, Corner Queens Blvd.
Woodside, L.I., N.Y. Phone—111, 8-7430

USED EQUIPMENT

All In Excellent Condition

- 1 K 14 Inaley Crane
- 1 T.D.9 Int. Crawler Front End Loader, Like new
- 1 30 Ton Tandem Axle Trailer Low Boy, New January '51
- 1 Mack Tandem Axle Tractor
- 1 P & H Trench Machine Model 18-36, Digs up to 21'

JANISCH-HAGERTY, Inc.
700 N. Bluff Street
JANESVILLE, WISCONSIN

WANTED

for T-6 International Crawler, complete track frame assemblies with tracks or component parts to make up same.

J. W. HOPWOOD
R.D. No. 1, Box 40, Garrettsville, Ohio

FOR SALE

LIMA No. 802 Diesel Dragline. Swings tracks. Rebuilt at a cost of over \$14,000.00. New ready. Looks and runs like new. \$34,000.00. Missouri. Rental, purchase.

MONTON 93-M. Shovel-Dragline. D-17000 Cat. Diesel. Light weight. 2 1/2 cu. yd. dipper. 14,000 lb. extra counterweight. New 1948. Good condition. \$36,000. Ohio.

WHITEWELL No. 5, ser. No. 4182, 1 1/2 cu. yd. shovel-dragline, backhoe combination. Cummins Diesel H81600. Old hot in good condition. \$19,500.00 N.J.

BUCYRUS-ERIE 43-B, 1 1/2 cu. yd. shovel-crane-dragline. Body, 6DB4 Diesel. Very good condition. \$18,000. N.J.

MARION No. 111-M. Diesel Dragline. 5 ft. boom. 5 yd. buckets. One rebuilt and one reconditioned. \$52,500.00. West Coast and Arizona.

LI-DEE DITZ SPEEDER L-50, ser. No. L850-SD454. 1946. Diesel. 1 cu. yd. shovel dragline. Good. \$6,500.00. K.C. Mo.

WILLIAMS Clamshell bucket. 1 cu. yd. A1. \$750.00. Old. 1 1/2 cu. yd. Dragline bucket. Standard. New. \$300.00.

PARSONS No. 310 Ditcher. Diesel. New 1948. A1. \$14,500.00.

BUCKEYE No. 301 Ditcher. New 1947. A1. \$4,500.00. Diesel.

ROGERS 20" x 36" RB. Crusher with apron Feeder. \$7,500.00.

UNIVERSAL 18" Conveyor. 40 ft. centers. New.

SECO 4' x 10" Double Deck Screen. A1. \$1,250.00.

UNIVERSAL 18" Conveyor. 40 ft. centers. New.

\$1,250.00.

IOWA 24" Conveyor 60 ft. centers. A1. \$1,350.00.

BARBER-GREENE Portable Dryer. No. 831-1-15.

Crusher, 1 cu. yd. hopper, plate feeder, engine. Unused. \$2,500.00.

**WENZEL MACHINERY
RENTAL & SALES CO.**
2134 Jefferson St., Kansas City, Mo.
Tel. Harrison 0221

3 wheel Huber roller, 10 ton, gas motor. Requires some repairs. Will sell cheap.

WILLIAM McCORMICK
R.D. 2, Route 62, Cuyahoga Falls, Ohio

CLEARING HOUSE

WE'RE STILL ABLE TO SUPPLY YOU!

This is Our Eleventh Shipment of Hard-to-Get Gov't Surplus



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CONSTRUCTION EQUIPMENT

CRANES - TRACTORS - FORK LIFTS - COMPRESSORS
GENERATOR SETS (DIESEL & GAS) - DITCHERS
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BUCKETS - DOZER BLADES - SHEEP'S FOOT TAMPERS

TRUCK PARTS

GMC - INTERNATIONAL - DODGE - AUTOCAR - JEEP
DIAMOND "T"

DUAL DRIVE UNITS - TRUCK MOTORS (Diesel & Gas)
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REAR DRIVE UNITS - FRONT DRIVE UNITS - HUBS
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POWER TAKE-OFFS

CALL OR WRITE US FOR ALL YOUR TRUCK NEEDS

Now, TWO CONVENIENT LOCATIONS

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DEAN BROS.

WRITE TODAY!

911 Ferry St.
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BUY-RITE TRUCK
& EQUIPMENT INC.

3645 Jensen
Drive
Houston, Tex.
•
Blackstone
6641

FOR SALE

5-1941 High Dump Jaeger 4 cubic
yard Truck Mixers

5-1941 High Dump Jaeger 3 cubic
yard Mixers and Trucks, Mack
and International

THE GOFF-KIRBY COMPANY
CLEVELAND, OHIO

MAin 1-8600

CATERPILLAR No. 12 Motor Grader, serial #T6482, 75 hours, cab scarifier, large tires, hydraulic booster steering. New Grace Model 50 rapid fire asphalt heater and appurtenances. 46 Model Ford 2 ton truck with winch, heavy steel bed and fifth wheel. 46 Model No. 720 GMC truck with winch, auxiliary transmission, heavy steel bed with tool boxes and fifth wheel. Either can be used as a tractor or winch truck, both in good condition, motor and tires. 12 ton low-boy trailer, new tires. E. D. Baker, Box 190, Borger, Texas.

FOR SALE

"Caterpillar" Do w/ LoTarnnas steel blade &
P.U. Vane scarifier. Friend to sell.
Also 3-1/2" Athey overhead leader attachment.
Tractor may be bought with or without either attachment.

MAY SAND & GRAVEL CORP.
Hayden Rd. Ft. Wayne, Indiana
Harrison 2100

FOR SALE

1-100 HP, 2200 Volt, 3 Phase, 60 Cycle
General Electric, 600 RPM Slipring
Motor, Primary Oil Switch, Drum
Control and Grids. Rebuilt by West-
inghouse and ready to go.

Regular price \$3,916.00
OUR SPECIAL \$2,000.00

WHEN YOU CAN'T FIND IT,
TRY PORTER

Porter Electric Company, Inc.
116-118 Third Avenue North
Minneapolis 1, Minnesota

FOR SALE

1-Super "C" Tornadousier near new condition, with
cab and electric unit for scoop.

1-Adams SII Motor Grader, good condition.

BONAHOOM-O'MEARA
CONSTRUCTION CO.
Hartington, Nebraska

FOR SALE
3-2 1/2 cu. yard. Koppel Jack knife type
stone buckets.

Excellent condition—Low price

COLUMBIA MACHINERY &
EQUIPMENT CO.
620 No. Henry St. Alexandria, Virginia

BOILERS

PORTABLE LOCOMOTIVE FIRE BOX
75 to 110 HP 150# ASME Code. New hubs and
equipped with steam atomizing oil burners.

NATIONAL BOILER &
EQUIPMENT COMPANY
1501 S. Senate Ave., Indianapolis 25, Ind.

FOR SALE
2 WOOLDRIDGE SCRAPERS

T C N 18 cubic yard

REASONABLE

ORR CONSTRUCTION
CO.

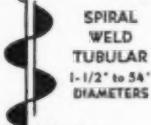
27 E. 19th Place

CHICAGO HEIGHTS, ILL.

Phone Chicago Heights 90

AUGERS
of every description

TWISTED
STEEL
1-1/4" to 3
DIAMETERS



Shanks and Sockets
to meet your specifications

THE SALEM TOOL CO.
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We do a Nation-Wide business in
STEEL SHEET PILING

New and Used Rented and Sold

130' per. 60 ft. Cern. M115-Chicago
62' per. 53-59 ft. Inland 127-Nebraska
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Other lengths and sections at various locations
All sizes Vulcan & McKernan Pile Hammers
& Extractors for Rent and Sale—Shop Rebuilt

Regardless of location of your job, wire or write

MISSISSIPPI VALLEY EQUIPMENT CO.

315 Locust St., St. Louis, Mo.
"WE BUY STEEL PILING FOR CASH"

TRUCKS WANTED

Highest dollar value paid for new
and used trucks and all kinds of used
equipment. All types of truck equipment
bought and sold, including war
surplus. Write, phone or wire:

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Pile Driving Equipment

Vulcan and McKernan-Terry
Steam Pile Hammers and Extractors

Pile Driving Accessories

Drop Pile Hammers and Caps

Steel Sheet Piling

CONTRACTORS MACHINERY CO.

2651 Southwest Blvd.
Phone Valentine 4746
Kansas City 8, Mo.

An Auction—Heavy Equipment

Monday, August 20, 10:30 A.M.

Knoxville, Iowa which is just 38 mi. Southeast of Des Moines; 1 K 595 No. 7730 Link-Belt Speeder drag-line, 75 ft. boom, 10' extension, D 17000-Cat. motor including light plant, A-1; 1 85 model Northwest drag-line, No. 3884, ME6 Murphy diesel motor, 75 ft. boom, A-1; 1 model No. 6 Northwest drag-line No. 3041, D88 motor, 55 ft. boom, A-1; 1 B-4 L-B Speeder drag and shovel comb., No. 1144, gas engine; 1 B-3 L-B Speeder shovel, No. 978; 1 LS 40 L-B Speeder drag and shovel attach., No. 504; 2 D-7 Caterpillar tractors, hydraulic dozers, 3T series, 10 months use; Compressors; Light plants; 2 to 4" pumps; Vertical coal drills; Power plants; Buckets; quantities of cable; Electric motors; Trucks; shop equipment; and many many other items large and small. Write or wire the auctioneers for complete sale bill. Everything POSITIVELY SELLS TO THE HIGHEST BIDDERS WITHOUT RESERVATION!!!!

Dunreath Coal Company, Owner

Forke Brothers & Ficke
The auctioneers
PHONE 2745 314 SHARP BLDG LINCOLN, NEBRASKA
Midwest Auction Leadership Since 1921

For Sale or Rent

BUCYRUS-ERIE Model 29-B shovel powered W/Caterpillar" D8800 Diesel engine. 1 yd. dipper \$11,000.00
BUCYRUS-ERIE Model 19-B Combination Shovel, Crane & Dragline \$7,500.00
BUCYRUS-ERIE Model 15-B combination shovel, trenchhoe & clamshell \$9,000.00
TRACTOR, IHC Model TD-14 with Bucyrus-Erie hydraulic bulldozer \$7,500.00
KOEHRING Model 301 Comb. Shovel & Dragline Pr. \$7,500.00
PIONEER 1534 roller bearing jaw crusher, skid mtd. \$4,500.00
"CATERPILLAR" Model D-8 Tractor with La-Tourneau dozer & DDPUC. Rebuilt \$9,000.00
INTERNATIONAL TD-18A. Equipped with B.E.-DDPUC & Cable Angledozer. \$13,750.00

EMMETT C. WATSON CO., INC.

310 E. Brandis St., Louisville 8, Ky.
Phone: CALhoun 7648

FOR SALE

Insley K-12 40 ft. boom, extra counter weights, $\frac{5}{8}$ -yd. Hendrix heavy duty drag bucket, Chrysler 8 cylinder engine.

This machine is in excellent condition. Just like new. Has only handled 25,000 yds. of gravel, has never been moved from gravel pit.

JOSEPH BEAR

Phone 260 Clarks Hill, Indiana

FOR SALE

2-LF-210 Int. Trucks with 12 yd. Heavy Duty St. Paul Bodies equipped with Aux. Transmissions. 193" W.B. Tandem Drive, 25-30000 mi. Bought new in April 1950. New price \$12262.00. Your choice for \$6500.00. Deduct additional \$500.00 for box if not wanted. Tires are excellent. 1000x20 fourteen ply all around. A picture of one of these units may be found on page 35 of January 4, 1951, Construction Bulletin, Item 11.

G. H. LINDEKUGEL & SONS
SPENCER, SOUTH DAKOTA

FOR SALE

1-K4 Link Belt Crane, $\frac{1}{4}$ yd., 40' boom.
1-303 Moorseepd Crane, 1 yd., 50' boom.
1- $\frac{1}{2}$ yd. P&H Back Hoe att., 17' digging depth.
1-346 Foote Paver, single drum with 35' boom.
1-Knickerbocker 10 SE Mixer on 2 Pneumatic Tires, Power Loader & Water Tank.
1-D4 Caterpillar Tractor, LaPlante-Choate road builder blade.
1-Gar Wood Model CV-2 Cable Control Unit.
1-D17000 85-95 KW Caterpillar Diesel Electric Generator Set.
2-1946 Model F6 Ford Truck, Chassis with 2C Dumptruck Bodies.
5-Model U407 Autocar Chassis with 4C Dumptruck Bodies.
4-Model 4C Dumptruck Bodies.
3-Model EQUIP Mack Chassis with 4C Dumptruck Bodies.
1-12' Dump Body & Hoist Complete.

ALLIED CONCRETE SUPPLY CO.
3727 So. Maplewood Ave.
CHICAGO 32, ILL.
Phone Virginia 7-7117

FOR SALE

One 120 H.P. Model FDE Oliver Crawler Tractor and Heil Bulldozer. Completely overhauled. 3 years old. Excellent condition. Price \$8000.00

One TD 18 International Crawler Tractor and Gar Wood cable dozer. Double drum PTO, new final drive gears and new transmission. Motor now being overhauled. Price 4500.00

One TD 18 International crawler tractor with Bucyrus Hydraulic dozer in good condition. 1949 Model. New track rails. Price 7000.00

One DDH Oliver 61 H.P. Crawler Tractor, diesel. Complete motor overhaul, Drott hydraulic blade. Ready to give fine performance. Entire machine current model. Price 5000.00

One DDH Oliver crawler tractor with Heil hydraulic blade. Good condition. $\frac{1}{2}$ years old. Price 4500.00

One TD 14 A Crawler and Bucyrus hydraulic dozer. 1 year old. Carco F. Winch, new track rails and new 100 hr. bottom rollers. 1200 hours. Price. 7500.00

One TD 14A Crawler Tractor, Carco F. Winch, new track chains and new 100 hr. bottom rollers. Machine 6 months old, 700 hours. Like new. Price. 6800.00

One Model BD Oliver Crawler, diesel. 40 H.P. Correct size for logging or farm. Working now. Price 1600.00

One Model 40 diesel Caterpillar. Good working condition. Price 800.00

One Model R5 Caterpillar. Working when brought into our yard. Price 500.00

One Model K Allis Chalmers Crawler in good condition except needs a little radiator repair. Price 400.00

One Unit Dragline, $\frac{3}{4}$ yd. capacity. All gearing and bearings in gear case new and new rollers. GMC Diesel motor 1 year old. Fine machine. 48 Model. Price 8500.00

One Osgood, $\frac{1}{2}$ yard dragline. New Buda diesel power unit, track rails 1 year old. $\frac{1}{2}$ yd. bucket. Price 4000.00

One Adams 301 tandem drive motor grader. Good condition. Tires like new. Price 2000.00

Two Adams Motor Graders. Single drive. Case motor. Good rubber. Price 800.00

One 66 Austin Western motor grader. Single drive. Tires fair. Price 800.00

One Buda 100 H.P. Diesel Power Unit on steel skids Model 4 DC-645. 3 years old, equipped with starter, radiator, clutch, and V belt drives. Price. 2000.00

One MM 40 H.P. Wheel tractor with Hydraulic hi-lift front end loader 3 years old. O.K. Price 1800.00

One Model D4 Tournapull, good condition. $2\frac{1}{2}$ yard pan and bulldozer blades. Price 2000.00

**FRED MALOTTE
MACHINERY CO.
INC.**

**PETERSBURG
INDIANA
PH. 98**

J. K. WHEELER MACHINERY CO.

Used Equipment Inventory List

- 1 Cat. Diesel #10 Auto Patrol, single axle dual tires, Ser. #9F1063-5H89. A GOOD BUY!
- 2 Model 511 Adams Tandem Drive Motor Grader, Ser. #UDF1010Z1.
- 3 Model LS-85 L-B-S Shovel & Dragline Combination powered with D8500 Engine. Engine just completely rebuilt. Balance of machine in good working condition.
- 4 Rebuilt LS-50 Link-Belt Speeder Trenchhoe, Ser. #5D-330. Fully Guaranteed. A-1 Condition.
- 5 Model J12 LeT. 12-15 Cu. Yd. Carrryall Scraper, Serial #2661V4. IN GOOD WORKING CONDITION.
- 6 Rebuilt LeT. Model Super "C" Tournapulls, powered with 225 HP Buda Engines, 12-15 Cu. Yd. Scrapers. Units in A-1 Condition. A REAL BUY.
- 7 Le T. SUPER "C" Tournapulls, Ser. #C325-312-C1H; C325-332-C1H; #C325-307-C1H & #C37-6804-C1L, all with Cummins Engines & LP Scrapers with 21x24 rubber.
- 8 Model W210 LeT. Tournawagons to interchange with Item 7. Ser. #BY2240-W-210A; BY2255-W-210A; BY2273-W-210B & BY2280-W-210B, equipped with 21x24 rubber.
- 9 Model W210 LeT. Tournawagons, Ser. #BY2503-W-210E & BY2504-W-210E, equipped with 21x24 pneumatic wheels & newest type multiple disc air actuated brakes.
10. 2 K30 LeT. Rippers, Ser. #R6582-K-30 C & #R6583-K-30 C.
11. 1 Heavy Duty 3 Tooth Rooter. A-1 Condition—Wt. 8000 lb.
12. 1 Rebuilt Model D LeT. Tournapull powered with 4-71 GMC Diesel Engine. Tires: 4 18x25 with E-9 Scraper. Fully Guaranteed.
13. 1 Rebuilt LeT. Model Super C Tournadozer, Ser. #2543, powered with 225 Buda Engine, W/4 21x25 recapped tires, angledozer with tilting attachment. New performance guaranteed.
14. 1 Skid mounted 210 Cu. Ft. Gardner-Denver Air Compressor, Ser. #WD04009, Ser. #89437, powered by International Diesel Engine #UDF3120. "REBUILT TO NEW PERFORMANCE STANDARD."
15. 1 Model MHD-72 Seaman Pulverizer with oil mix tines, Ser. #978, powered by Waukesha Motor #46452 "NEAR NEW."

J. K. WHEELER MACHINERY CO.

1485 South 2nd West
SALT LAKE CITY, UTAH
PHONES 6-1212, 6-3431, 6-1514

AN AUCTION TRACTORS, CRANES and other EQUIPMENT

Monday, August 27, 9:30 A.M.

Savannah, Missouri

A very fine line of construction equipment will positively be sold to the highest bidders at the Clark & Runquist yard on the Southeast edge of the downtown district of Savannah, Mo.; Brand new, never used, 1½ yd. Manitowoc model 2000B, Clam, Crane, 70' boom, Serial No. 22141, dragline conversion, 14" crawler with 30" treads, a frame strut and stop, open throat boom point, auto safety boom stop and extended boom rigging; ¾ yd. Lorain Model 41 comb. clamshell and dragline, 60' boom, gas engine, A-1, LS-40 ¾ yd. Speeder converted to ½ yd. comb shovel, crane, dragline and clamshell, gas engine, A-1 LS-50 ¾ yd. Speeder, comb shovel, crane, dragline, clamshell and Trenshoe, A-1; 4 D-7 Caterpillar tractors, 3T series, DDP/CUs, 3 have dozers, 1 push block, all A-1; D-4 Cat tract, LaP-Ch pump and control unit, hyd. dozer, A-1; HD-7 track dozer; HD-5 tract, dozer; industrial type AC tract with mower; all tract A-1; LeTourneau carryall LSJ scraper, like new; Cat No. 70 scraper, like new; Model 118 Gallon patrol, HIC diesel engine, shiftable mold board, 11 tooth scarifier, new this yr.; GMC truck with quick-way crane; clamshell and dragline buckets, A-1; 10S Jaeger mixer, A-1; 11EL-4P4 Jaeger mixer, A-1; 16EL-4P4 Jaeger mixer, A-1; other concrete equip; 6 trucks; air tools; quantity of good shop equipment; and many, many other pieces of misc. construction equipment; WRITE OR WIRE AUCTIONEERS FOR COMPLETE SALE BILL; Everything POSITIVELY SELLS TO THE HIGHEST BIDDERS!!!!

Clark & Runquist Construction Co., Owner, Savannah, Missouri

Förke Brothers & Ficke
The auctioneers
PHONE 2-7045 314 SHARP BLDG. LINCOLN, NEBRASKA
Midwest Auction Leadership Since 1921

Equipment For Sale or Rent

1—LS50 Link-Belt Speeder Shovel, Serial 5D711, powered by Caterpillar Diesel D-311, Serial 785060; 1070 hours on meter. Machine is complete with ½ yard shovel front; 30' dragline boom with ½ yard bucket; ½ yard trench hoe. All attachments complete with lagging and cables. New machine guarantee. Price, f.o.b. Rapid City, S. Dak. \$13,500.00

1—Link-Belt Speeder ½ yard Shovel Attachment for LS85 complete with manganese dipper, lagging, cable, positive chain crowd, and power trip. Used two weeks. New guarantee. Price, f.o.b. Rapid City, S. Dak. \$3,800.00

1—Link-Belt Speeder ½ yard Trench hoe for LS85 complete with necessary lagging and cables. Thirty-six inch bucket. Used three weeks. New guarantee. Price, f.o.b. Rapid City, S. Dak. \$2,500.00

1—IHC-TD9 44" gauge, Serial No. 2640T14A. Equipped with lights and roller guards. Excellent condition. Price, f.o.b. Rapid City, S. Dak. \$2,850.00

Bulldozer components for 78 Caterpillar Dozer including sheave support and radiator guard, sheave hitch and sheave group. Price, f.o.b. Rapid City, S. Dak. \$435.00

1—New Cedarapids Portable Pitmaster Crushing Plant complete with Caterpillar D-315 Diesel Power unit, conveyors, belts, feeder and grizzly, and air brakes. Ready to start production immediately.

WEST RIVER EQUIPMENT

417 Pine Street

Rapid City, S. Dak.

Phone 4850

LARGE O.D. PIPE FOR SALE!

SEAMLESS, PLAIN ENDS:
200" 133" O.D. x .350 Wall 52.732 4" S. Lengths
200" 133" O.D. x .375 Wall 50.522 4" S. Lengths
200" 133" O.D. x .375 Wall 94.452 4" S. Lengths

BLACK ELECTRIC PIPE, PLAIN ENDS:

2" O.D.	200" x .350 Wall	52.732	4" S. Lengths
2.01"	200" x .350 Wall	104.132	39-40" Lengths
2.02"	200" x .350 Wall	104.132	39-40" Lengths
2.340"	25" x .375 Wall	125.492	39-40" Lengths
2.800"	25" x .375 Wall	77.225	18"-20" Lengths
2.800"	25" x .375 Wall	80.000	18"-20" Lengths
3.000"	25" x .375 Wall	106.2	18"-40" Lengths
3.000"	25" x .375 Wall	106.2	18"-40" Lengths
3.024"	30" x .375 Wall	107.2	18"-40" Lengths
3.024"	30" x .375 Wall	107.2	18"-40" Lengths
3.024"	30" x .375 Wall	107.2	18"-40" Lengths
3.024"	30" x .375 Wall	107.2	18"-40" Lengths
4.000"	36" x .375 Wall	107.2	18"-40" Lengths

ACT NOW! PHONE OR WIRE COLLECT YOUR REQUIREMENTS TODAY.

A. J. STRUBEL, BROKER. 4946 MURDOCH, ST. LOUIS, MO.
SIDNEY 1791 (DAY PHONE) HUDSON 8152 (NIGHT PHONE)

For Sale or Rent**1—N.W. Shovel**

2½ c.y. Model 80-D
New late '46. Used 2½ years.
Serial Number 8931

1—N.W. Shovel

1½ c.y. Model 6
New in '46. Used lightly.
Serial number 8817

Both machines in excellent condition

Williams Construction Co.
Box 145, Baltimore 20, Maryland
Telephone Essex 1310

For Sale

50 KVA Continental generator with excitor & automatic controls, 220 & 110, 1200 R.P.M., 3 ph., 60 cy. 1½ yd. Heli dump body, single barrel sub frame. Following electric motors: 3 hp., 60 cy. 220 v., 40 hp. Louis Allis, 1740 R.P.M., 60 cy. 220 v., 40 hp. Electric ring with controls, 1200 R.P.M. Westinghouse 20 hp, reversible, top 690 R.P.M. 25 hp. G. E., 1200 R.P.M. 60 hp. Westinghouse with Allen-Bradley starting switch, 1750 R.P.M. 15 hp. Wagner, 1140 R.P.M., 220 or 440 v. 7½ hp. Wagner, 1740 R.P.M., 220 or 440 v.

NELLIS
LIMESTONE QUARRY, INC.
Box 4, RIPPON, WIS.

FOR SALE

P&H comb. shovel and crane, less crane boom, Model 225A. Excellent condition, \$12,000 f.o.b. Milwaukee.

New, unused, 3-in. Carter centrifugal pump, powered by 4 cyl. Wisconsin engines, mounted on 4-wheel adjustable fired trailers. List price \$750.00; our price \$425.00.

Three Continental Model M120, 75 h.p. gasoline power units. Price right for quick sale.

Two, U2, 22 h.p. International Harvester power units, complete with radiator and clutch. One used, one new.

Unused 1½ in. by 10-ft. suction hose with brass male and female fittings. Price \$7.00 each, minimum order five.

Three American Diesel fuel injectors.

A. MARCHESE CO.
1737 N. 30th St., Milwaukee

STEEL SHEET PILING & HAMMERS

1200 Tons ZP 32 & ZP 38-40 to 63'
377 Tons DP 32/40/48
3-B-41 & 5-B-50
32 Steamer Cranes
9 McK T Hammers 6, 7, 8A, 9B, 11B,
Vulcan 5000, 1 & 2-Union 1, 1½,
Dixie 12, 14, 16, 18, 20, 22, 24, 26, 28
2000 and 2500 gal. Steel Tanks
1200 Tons Both Sp.-4, 10' to 40'
DARIEN, 60 E. 42nd St., N. Y. 17, N. Y.

FOR SALE

PD 40 International w/ clutch.
UD 9 International w/ clutch.
G.M. 671 w/ clutch. 37 kva, 230 volt, 60 cycle alternator attached.

CHURCHILL CONSTRUCTION CO.
1124 State Street, Lima, Ohio

FOR SALE**Buckeye Diesel Engines**

Mod. 80-4 cyl. 10% in. bore; 12 in. stroke; 240 H.P.—600 R.P.M. New. Is original crates. See.

ALLAN MORTON
4001 W. Washington Blvd., Los Angeles, Calif.

FOR SALE**#112 Caterpillar patrol grader**

Serial # 2M796

Excellent condition

Price \$5500.00

Can be seen at our shop—Bardstown, Ky.
SALTSMAN CONSTRUCTION COMPANY
BARDSTOWN, KENTUCKY

1918

CONSTRUCTION EQUIPMENT

New and Used

Sales—Rentals—Service**ALL EQUIPMENT & TOOLS**

for

Contractors and Industrials

Joy Air Compressors, Tools

Portable Air Compressors and Tool
Rentals Our Specialty

Rex Chain Belt Truck Mixers,

Pumps and Pumpcrete Machines

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